WHO WINS ON WALL STREET? GAMESTOP, ROBINHOOD, AND THE STATE OF RETAIL INVESTING

S. HRG. 117–95

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HEARING

BEFORE THE

COMMITTEE ON BANKING, HOUSING, AND URBAN AFFAIRS UNITED STATES SENATE

ONE HUNDRED SEVENTEENTH CONGRESS

FIRST SESSION

ON

EXAMINING THE PRACTICES THAT ENCOURAGED THE VOLATILE ACTIVITY IN STOCKS, HOW IT AFFECTS OUR ECONOMY IN THE LONG TERM, AND WHO BENEFITS AND WHO LOSES FROM THIS "TECH-INDUCED" STOCK MARKET VOLATILITY

MARCH 9, 2021

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C O N T E N T S

TUESDAY, MARCH 9, 2021

WHO WINS ON WALL STREET? GAMESTOP, ROBINHOOD, AND THE STATE OF RETAIL INVESTING

TUESDAY, MARCH 9, 2021

U.S. SENATE,
COMMITTEE ON BANKING, HOUSING, AND URBAN AFFAIRS,
Washington, DC.

The Committee met at 10:02 a.m., via Webex, Hon. Sherrod Brown, Chairman of the Committee, presiding.

OPENING STATEMENT OF CHAIRMAN SHERROD BROWN

Chairman BROWN. The Banking, Housing, and Urban Affairs Committee will come to order. This hearing is in the virtual format. A few reminders as we begin. Sorry to those of you who have to hear this every hearing.

Once you start speaking, there will be a slight delay before you are displayed on the screen. To minimize background noise, please click the mute button until it is your turn to speak or to ask questions.

You should all have a little box on your screens labeled "Clock" that will show you how much time is remaining. For witnesses, you will have 5 minutes for opening statements. For Senators, the 5-minute clock still applies to your questions.

At 30 seconds remaining for your statements and questions, you will hear a bell ring to remind you your time has almost expired. It will ring again when your time has expired.

If there is a technology issue, we will simply move to the next witness or the next Senator until it is resolved. And, fortunately, because of Cameron and Charlie's work, we rarely have technical problems, but one never knows. To simplify the speaking order process, Senator Toomey and I have agreed to go by seniority for this hearing.

Last February, as the world came to the collective realization that we were confronting a global pandemic, the U.S. stock market suffered its fastest drop in history, plummeting, as we recall, 34 percent in 33 days.

This was followed by the fastest stock market rebound in history, recovering all of those losses by mid-August.

It was clear what most working people had suspected for a long time: The stock market is detached from the economy and the reality of most Americans' lives.

The coronavirus was spreading, widespread testing was not available, and we did not know if the hope of a vaccine was months or, for that matter, years away.

Unemployment soared, reaching 23 million jobs lost by April. Almost a year later, only about half of those jobs have been recovered. Families and small businesses had no certainty about what their lives would look like in a few weeks, let alone next year.

But the stock market continued to go up and up. Those lucky enough to own investments reaped the profit.

To some, this looked like a new development. But to millions of Americans, to millions of workers who have watched the stock market reach new heights while their own paychecks never kept up, it looked pretty familiar.

Families have not been too surprised by this state of affairs. A whole lot of them never recovered from foreclosure or from losing their savings during the last crisis, but they watched Wall Street pocket its bailout and go on to record highs just a few short years later.

That is because when you look at who truly benefits, it is clear that the stock market's gains funnel wealth to a tiny sliver of people, often at the direct expense of American workers. We discussed this last week in our hearing "Wall Street vs. Workers."

According to Federal Reserve data, the wealthiest 1 percent hold 53 percent of stock and mutual fund investments. The bottom 90 percent own less than 12 percent.

The bottom 90 percent own less than 12 percent.

Between workplace retirement accounts and personal investments, about half of American households have at least one financial account tied to the market, but only one in six directly own stocks.

None of this reflects the actual makeup of the country. Only 31 percent of Black families and 28 percent of Hispanic families own any stock investment.

The wealthy are far more likely to have these accounts, of course, than middle-class families, who in turn are far more likely to be in the market than working-class families or poor families.

So when the stock market soars, most people barely notice. They are just trying to keep up with the cost of living within their paychecks.

In recent years, the growth of fintech in financial services has given rise to trading platforms that offer free stock trades. Firms like Robinhood and others claimed to "democratize" stock trading with flashy marketing and easy-to-use features.

And in one sense, it worked. They attracted millions of customers, many of them young and new to investing.

The frenzied stock trading this January, when shares of GameStop went from $18 to over $400 in a matter of weeks, showed how millions of retail investors could engage with each other and create a sort of sensation.

But it also lays bare serious risks.

There are real people who got caught up in the frenzy who suffered real consequences. If the people who are busy working, watching their kids, or living their lives cannot make sense of the stock market's booms and busts, they will continue to lose faith in

the market. And hedge funds and insiders will continue to reap the vast majority of the profit.

That is really bad for everyone in the long run.

Robinhood tried to blame its decision to cutoff its customers from being able to purchase GameStop and other stocks on industry-wide standards for processing stock purchases. Of course, the SEC and others should examine and consider how to reduce risk in the financial system by cutting the time it takes to complete stock purchases. Everyone would benefit from that.

But it has become clear that firms like Robinhood were founded on a model that exploits small investors by encouraging fast and loose trading, and then sells their trades to big market players.

In a few short years, Robinhood violated the law, failed to respond to customers when they needed help, and when it got in trouble, cutoff customers to save itself. Robinhood attracted new customers to investing, encouraged them to trade, profited off of them, and then broke their trust—precisely when they needed the company to have their backs.

It is also obvious that the David versus Goliath story—to mix metaphors, perhaps—we first heard in January was not the whole picture. Well-funded, sophisticated hedge funds made big profits alongside the people trading at home. We know they always had better access and information than any of us ever will. No one thinks that is fair.

Some have tried to blame the small-time investors. They scold people just trying to make some extra money in the worst job market we have seen in most of our lifetimes.

Because of the Robinhood business model and other reasons, we have all learned the new term "gamification."

But let us be clear: We have seen Wall Street treat the markets as a game for decades—a game they always win, at the expense of pretty much everyone else.

Wall Street has never been friendly to the little guy. Surely this time is no different.

Yes, some regular people have had success. But, fundamentally, the system is set up to funnel more wealth to the already wealthy. Just like in Las Vegas, the house always wins.

The economy and the markets should work for everyone, not just the well-connected. They should reflect the economy we all want—with broadly shared prosperity and a growing middle class that all workers have the opportunity to join.

When that happens, people will have confidence the markets can actually work for them, not just Wall Street. We will see more Americans save and invest for the future.

This hearing will examine not only the volatile activity in a dozen stocks early this year, but also the practices that encouraged that activity. We will see how it affects our economy in the long term. We will see who benefits and who loses from this "tech-induced" stock market volatility.

I look forward to the testimony from all five of our witnesses.

Senator Toomey.

OPENING STATEMENT OF SENATOR PATRICK J. TOOMEY

Senator TOOMEY. Thank you, Chairman Brown. Welcome to all of our witnesses.

This January's volatility in the stock market understandably captured everybody's attention. We saw extraordinary trading volumes in GameStop and other stocks, and we also saw some brokers limit stock purchases during this period of volatility. So it is entirely appropriate to examine these events and try to understand what happened and whether any response is needed.

However, I urge my colleagues and regulators to avoid any knee-jerk reaction to impose unnecessary restrictions and burdens on investors. We have yet to see any evidence of wrongdoing or that the regulatory regime failed to function as intended. And Congress and regulators should avoid new laws and regulations that could end up limiting investors' access to and choices in the stock market.

One reason to tread cautiously is that new developments have made it a great time to be a retail investor. Today a person of modest means can invest in the stock market at zero or minimal cost. Two developments particular stand out: zero commission trading platforms with no minimum account balance required, and a user-friendly trading technology such as mobile apps. Zero commission trading is the culmination of a decline in investor costs since the SEC abolished fixed commissions in 1975 and forced brokers to compete against each other.

In the 1980s and 1990s, it could cost you close to $100 to buy several thousand dollars worth of stock. By the 2000s, online trading sites offered lower costs, but they could still cost you $30 for a trade. Competition from market makers allows brokers under their best execution obligation to obtain a better price for investors than current market price, even after receiving a payment for order flow, and they can charge zero to investors.

Similarly, new technology like app-based trading platforms make it easier to access the market, including buying through fractional shares. And it is not just Robinhood attracting new investors. The Wall Street Journal reported that 2020, despite the volatility, was a record year for new individual accounts, and these developments have, of course, contributed to broader investment in the stock market.

According to the Federal Reserve, in 1989, less than one-third of U.S. households owned stocks. Three decades later, in 2019, a majority of American households did. And the most rapid growth is among low- and middle-income households. Now, let us not forget about the millions of others, including police officers, firefighters, teachers, and other workers indirectly invested through pension funds.

This allows everyone to share in the tremendous wealth gains generated by the stock market, which used to be available only to wealthy individuals and institutional investors.

Despite these positive developments, some see the state of retail investing only in negative terms. Rather than celebrating the fact that it is cheaper and easier for average Americans to invest in the stock market, some claim that the market is somehow rigged against retail investors.

So to my colleagues who say that, I would like to hear why they believe that. Does the retail investor not receive dividends like institutional investors do? Is the retail investor not entitled to best execution on trade like institutional investors? When a stock goes up in value, does the value of a retail investor's share not go up like wealthy individuals?

Of course, the answer to all of these questions is obviously no. And if the market is rigged, then why did some hedge funds lost their shirts shorting GameStop while some retail investors hit pay dirt for buying it?

I am also incredulous at the idea that it somehow hurts retail investors to have access to investing technologies that are inexpensive and pleasant and easy to use. Retail investing does not need to be expensive and miserable and difficult to experience, nor should we want it to be. I would like to see more U.S. households have the opportunity to benefit from the financial gains that are available through the stock market.

Your average American does not need Big Government coming in to limit her access to and choices in the stock market. The fact is risk is a fundamental part of investing. All investors, whether they are small retail investors or big hedge funds, can gain or lose money by investing. But what we know is for sure over time long-term investors investing in U.S. stocks, it is the exact opposite of going to the casino. Investors win, and when you go to the casino, you lose. Investors in GameStop and a few other stocks took a lot of risk, but they represent a very, very small fraction of retail investors. And investors should understand that if they make a very risky investment, they might lose money. Those who bought GameStop at its high very likely lost money. I certainly hope they did not invest money they could not afford to lose, but it is not the Government's job to tell people which stocks they can and which they cannot buy.

In my view, there is one action that regulators should pursue, and Chairman Brown alluded to this, and that is to finish the work that it started in 2004 for a faster settlement cycle, including same-day cycle or maybe even real-time settlement. A faster settlement cycle will reduce risks for clearing agencies because there will be fewer unsettled trades and a reduced time period of exposure. And a faster settlement cycle will also require less collateral for clearing agencies, which may reduce margin charges and other fees that are inevitably passed on to investors.

When the SEC moved to T+2 back in 2017, the SEC said it wanted to make settlement even faster, and last month, Ranking Member McHenry from the House and I wrote to the SEC asking that they follow through on this longstanding objective.

Let me close by just repeating: I think Congress and the regulators should tread very cautiously here. We should want to make sure that all parts of American society can participate and share in the gains of the stock market, and we should avoid taking actions that would undermine that goal.

I look forward to today's testimony.

Chairman BROWN. Thank you, Ranking Member Toomey.

I will introduce today's five witnesses. Gina-Gail Fletcher, professor of law at the Duke University School of law. Professor

Fletcher is a scholar of complex financial instruments and market regulation. Her research focuses on the interplay of public regulations and private ordering in enhancing market stability and integrity. Welcome, Professor Fletcher.

Rachel Robasciotti is the founder and chief executive officer of Adasina Social Capital, an investment firm that seeks to serve as a bridge between financial markets and social justice movements. Welcome, Ms. Robasciotti.

Dr. Teresa Ghilarducci is an economist, nationally recognized expert in retirement security. Dr. Ghilarducci holds the Irene and Bernard Schwartz Chair in Economic Policy Analysis in the Economics Department at The New School for Social Research. She directs the Schwartz Center for Economic Policy Analysis that focuses on economic policy research and outreach. Welcome, Dr. Ghilarducci.

Commissioner Michael Piwowar is the executive director of the Milken Institute Center for Financial Markets. Commissioner Piwowar served as a Commissioner at the U.S. Securities and Exchange Commission from August of 2013 to July of 2018 and was Acting Chair from January to May 2017. Previously, he was the Republican Chief Economist for the

U.S. Senate Committee on Banking, Housing, and Urban Affairs under Senators Crapo and Shelby. Welcome back, Commissioner Piwowar.

Andrew Vollmer is a senior affiliated scholar with the Mercatus Center at George Mason university. From 2014 to 2019, he taught securities regulation. He is the director of the John W. Glynn, Jr. Law & Business Program at the University of Virginia School of Law. Prior to that, Mr. Vollmer was a partner in the securities litigation and enforcement practice at Wilmer Cutler Pickering Hale and Dorr, and he also served as Deputy General Counsel at the SEC from 2006 to early 2009. Welcome, Mr. Vollmer, to our Committee.

Professor Fletcher, would you begin your testimony,please, for 5 minutes? Thank you.

STATEMENT OF GINA-GAIL S. FLETCHER, PROFESSOR OF LAW, DUKE UNIVERSITY SCHOOL OF LAW

Ms. FLETCHER. Chairman Brown, Ranking Member Toomey, Committee Members, thank you for inviting me to testify today. I am a professor of law at Duke University, where my research focuses on capital markets, financial regulation, and market manipulation.

Our capital markets exist to channel investors' capital into its best uses, ideally forming companies to increase sales and create jobs, but also providing investors with reasonable returns, allowing them to save for retirement or to send their children to college.

We are here today because we are seeing trading activity that seems to be divorced from this essential purpose. Since the start of the year, GameStop's stock has gone through quite a bit of volatility. It started at a little under $20 a share at the beginning of the year, went up to $400, down to $40, and now as of yesterday was a little bit under $200 per share, all of this occurring over just a few weeks.

As the company's stock price yo-yos back and forth, it is clearly not a good-faith reflection of the fundamental value of a company with real stores, employees, and sales. The volatility in GameStop's stock is just one of a growing number of examples of market price gyrations which seem to be impacting not only meme stocks but also some penny stocks, special purpose acquisition companies, and even cryptocurrencies.

Financial innovation has made it easier than ever for retail investors to trade more complex, leveraged, and risky assets than ever before. These developments have generally expanded retail participation in the markets, and in some ways this is great. For example, a recent study has estimated that the racial gap in individual stock ownership has been halved in less than 5 years because of greater lower-cost market access. However, recent market events have raised questions about the integrity and long-term stability of the markets.

Now, while my written remarks cover several topics, I wish to highlight a few key points here.

First, to the extent that asset values are subject to wild swings and are divorced from any semblance of fair market values, market participants will increasingly view the markets as rigged and unreliable. This will in the long run deter investment and harm our economy.

Second, Congress and regulators should act to ensure that those who deliberately distort prices may be subject to regulatory or prosecutorial discipline.

Third, Congress and regulators should address the incentives and market structures that have created the modern trading markets. This includes the proliferation of payment for order flow practices, the segmentation of retail orders, and the overall impact on trading costs for all investors, not just retail investors but pension funds and other institutional investors. It is clear that retail brokers and market makers are making quite a bit of money from these practices, but it is also increasingly clear that retail and institutional investors are paying the price.

Fourth, Congress and regulators should review whether and how investors should access complex leveraged products, such as call options. Opening options trading accounts used to take weeks, and still does with some brokers. Yet it may take just a few minutes with other brokers. It should not take a suicide for us to realize that many investors in current markets do not fully comprehend the products that they are trading or the risks that they are taking.

Fifth, finally, and perhaps most importantly, Congress and regulators must acknowledge that events like what we are seeing with GameStop and other assets are no longer outlier events, but are instead regular features of our current system. Unless action is taken, these events will continue to expand and evolve. This means that brokers need to be better prepared to stand behind their customers' risky trading, and to the extent brokers cannot, the answer ought not to lie with limiting retail participation, as seems to have happened recently when some broker-dealers suspended trading in highly volatile stocks.

Additionally, regulators should consider shortening the settlement cycle so that fewer things can go wrong between the time of trade execution and when parties match up securities and cash.

Today it is easier, cheaper, and faster to trade more complex and leveraged financial products than ever before. This new market reality requires that we rethink the risks that accompany these developments and in so doing consider how to create a market that is fair, accessible, and stable for investors and the rest of the economy.

Thank you.

Chairman BROWN. Sorry, I was having trouble with the mute. Thank you, Professor Fletcher.

Welcome, Ms. Robasciotti. Speak for 5 minutes. Thank you.

STATEMENT OF RACHEL J. ROBASCIOTTI, FOUNDER AND CHIEF EXECUTIVE OFFICER, ADASINA SOCIAL CAPITAL

Ms. ROBASCIOTTI. Mr. Chairman Brown, Ranking Member Toomey, and Members of the Committee, good morning, and thank you for inviting me to testify before this Committee. It is my great honor.

My name is Rachel Robasciotti, and I hold leadership positions at two SEC Registered Investment Advisory firms. I am the founder and CEO of Adasina Social Capital, where we manage an exchange-traded fund with the ticker symbol JSTC. It holds over 800 stocks and is accessible to everyday investors at a price of about $16 per share. I am also the director of advocacy and engagement for Abacus Wealth Partners, which is a firm with $3.8 billion in assets under management but no minimum account size for its clients.

I serve hardworking, everyday Americans, so your constituents and my clients are the same people.

I have worked in financial services for almost 22 years, so I take the long view of market events, and I have seen everything from the ill-fated dot-com boom of 2000 through the Great Recession and the most recent GameStop–Robinhood episode in January and February. So I understand the players in the market, and in this most recent situation, there are really three groups for us to consider.

First is the hedge funds. These are institutions that primarily manage money for the wealthy, accredited investors, and they are known for their risky strategies and high returns.

Two, the Redditors, these tech-enabled young people who use commission-free trading and banded together to outwit the hedge funds they felt had an unfair advantage.

Third—and these are the folks that I am here for today—are the everyday Americans, hardworking people with long-term retirement savings invested in the stock market. These people rely on Government institutions and financial professionals to look out for them.

When the GameStop–Robinhood episode occurred in January, I was immediately reminded of the MIT Blackjack Team of the 1990s, when a group of students banded together to break the bank at several large casinos. They realized that if they worked together, they could win substantially more money than the average gambler. So using their math skills and their technology, they coordi-

nated to quickly and strategically place large bets against the house.

It is pretty easy to see the obvious similarities between the two situations. Like the MIT students, the Redditors in January were young, knowledgeable people with high appetites for risk who chose to collectively speculate by making quick bets against a larger player with a perceived advantage.

On the other hand, like the casino owners, the hedge funds are these large institutions with specialized knowledge about the game who some say routinely use their size to tip the odds in their favor.

What is not obvious, whether in the casino or in the stock market, is what the wealthy institutions and upstarts have in common. They are all fast-moving, high-risk speculators with more skills and tools than the average person.

But there is a problem here for the stock market, which is supposed to be a place where a person can grow wealth by investing in companies that have good prospects. But when fast-moving, high-risk speculators dominate, we have a classic recipe for market disruptions. What we saw in January with GameStop and Robinhood is what we saw during the Great Recession with Wall Street churning out subprime, mortgage-backed securities.

Market disruptions like this are a problem because, as stated by SEC Commissioners in January, " . . . extreme stock price volatility has the potential to expose investors to rapid and severe losses and undermine market confidence."

Now, unfortunately, this volatility does not impact everyone equally, and let me paint the picture of what the everyday investor experienced. Imagine a two-job household with a couple of kids, adults working hard to make ends meet and save enough for the future. They do not have a pension to fall back on for retirement because so few pensions now exist. They know that Social Security benefits their parents receive are not enough to cover most retirees' basic needs. And for several decades now—and this is key—the economy has only offered these savers historically low interest rates, which means that putting their money in low-risk savings accounts, CDs, or bonds barely makes them enough to keep up with inflation.

This leaves investing in the stock market as their only option. It is the only way their savings can grow enough to provide for the future. So they are forced into the "stock market casino" with their life savings. And they are required to play against armies of sophisticated, high-risk hedge funds and Redditors duking it out for dominance. For everyday Americans with smaller amounts that represent all that they have to invest, sustaining significant losses—or even the perception of losses—is devastating. It makes them lose confidence and want to opt out altogether. But we know they cannot leave the casino.

As an investment professional who works for everyday investors, and as Senators with these same people as your constituents, we must fix the system for them. We need to maintain fair, orderly, and efficient markets that serve as a reasonable place for the average American to invest their life savings. And we have a duty to protect these investors from the crossfire of fast-moving, high-risk speculators.

Chairman BROWN. Thank you, Ms. Robasciotti.
Ms. Ghilarducci.

STATEMENT OF TERESA GHILARDUCCI, BERNARD L. AND IRENE SCHWARTZ PROFESSOR OF ECONOMICS, THE NEW SCHOOL

Ms. GHILARDUCCI. Hello. Thank you for inviting me, Chairman Brown and Ranking Member Toomey, and hello to the Members of the Committee.

I am a professor of economics at The New School. I teach behavioral finance and labor markets. I also taught at the University of Notre Dame for 25 years. I received my Ph.D. from UC Berkeley, and I have published four books on how workers acquire wealth. The latest one was "Rescuing Retirement" with my co-author Tony James.

I also am a court-appointed trustee overseeing $60 billion of the retiree health care trust fund money for auto workers, and that money is invested to last over 80 years.

Now, as a professor, my office hours are typically quiet moments huddled over equations and numbers. But over the past few years, I have seen another trend. Students are coming to me bubbly because they want to know about trading on their phone app, Robinhood. Now, the young are told to buy stocks and they are told to hold them, but these students have absorbed the first point but they have not absorbed the second.

Trading on Robinhood is a game, and it has psychologically powerful intermittent rewards. The trading is disconnected from long-term wealth accumulation. Phone apps makes trading easy, and they are cheaper, and superficially they seem to open securities markets to many more people. But trading apps do not produce wealth.

I welcome today's hearing seeking to protect retail stock buyers, seeking to protect my students. And I am here to testify where Americans really get their wealth.

So I am going to huddle over a few numbers in the next few minutes, and I draw my data from the gold-plated data from the University of Michigan, the Health and Retirement Survey, and I am looking at households where people are still working, they are over the age of 52. They have gone through their life cycle. They have accumulated their wealth, and we are going to take a snapshot of what their wealth looks like.

So averages hide differences, so I am going to report my numbers in terms of the bottom half of the wealth distribution, the middle class and the next 40 percent, and what the top 10 percent of the wealth distribution have.

Now, you probably have already guessed that home equity, the net wealth from their homes, and retirement wealth, including Social Security, are by far the largest component of wealth for everybody. Those components make up 88 percent of the wealth held by households in the lower half of the wealth distribution, 78 percent for the middle class, and 43 percent for those in the top 10 percent.

I am going to make a side track note to note what Social Security means to households. I am always surprised to see that Social Se-

curity is the most important source of wealth for households nearing retirement.

In contrast to home equity, retirement wealth, and Social Security, directly owned stocks and bonds make up a small share of these households' wealth. The average is only 8 percent. Only 24 percent of older households own stocks directly, outside of their retirement accounts, and that ownership, that 24 percent, is concentrated way at the top. Only 10 percent of people below the median own stocks directly, and it is a small amount, and less than a third of the middle class owns stocks directly.

And the wealthy, 70 percent of them do own stocks directly outside of their retirement wealth. But it is only 13 percent of their wealth.

As Nobel Prize winner Robert Shiller the economist's recent book just points out, stock trading feeds a narrative. It feeds a story about wealth. Stories about getting rich on stocks produce a fiction that stock trading creates wealth, when, in fact, retail investors fuel bubbles, as the witnesses have testified to.

Defenders of Robinhood and widespread trading have purchase because the COVID recession has produced wealthy people who have gotten wealth. Their gains heighten the fear of missing out, or FOMO. The reality is that most Americans are being left out because they do not have access to retirement accounts, which is where most of us who own stocks. Retirement accounts are invested in diversified portfolios managed by institutional investors and professionals. It is those professionals that can handle the complex instruments for investments, and it is those professionals that accumulate savings, hard-earned savings by workers, and invest them in diversified portfolios.

We need innovations in public policy to give more Americans access to what we know works: professionally managed retirement coverage that allows everyone to benefit from the stock markets the same way you and I do in the Thrift Savings Plan, in private or public defined benefit plans—as Senator Toomey mentioned, the firefighters and the teachers—or in my pension plan, the Teachers Insurance Annuity Association. We all need a piece of diversified, well-managed, professional accounts.

Thank you very much.

Chairman BROWN. Thank you, Dr. Ghilarducci.

Commissioner Piwowar, please proceed for 5 minutes.

Thank you.

STATEMENT OF MICHAEL S. PIWOWAR, EXECUTIVE DIRECTOR, MILKEN INSTITUTE CENTER FOR FINANCIAL MARKETS

Mr. PIWOWAR. Good morning. Thank you, Chairman Brown, Ranking Member Toomey, and members of the Committee for inviting me to testify today.

My name is Mike Piwowar, and I am the executive director of the Milken Institute Center for Financial Markets. I had the pleasure of serving on this Committee's staff as Republican Chief Economist for Senator Shelby and Senator Crapo. I also served as a Visiting Academic Scholar, Senior Financial Economist, Commissioner, and Acting Chairman of the Securities and Exchange Commission.

I am glad you called this hearing today on the state of retail investing. As we have heard, on the one hand, retail investors have never had it better. They enjoy more choices and face lower costs when investing their hard-earned savings than ever before. They can invest directly in securities through brokerage accountable, and competition among brokers has led to commission-free trading. Competition among exchanges, alternative trading systems, and market makers has led to the best market quality environment for publicly traded securities in history. Transaction costs are low, market depth is high, and execution speeds are fast. Retail investors can make their own investment decisions, or they can seek the advice of well-regulated investment professionals through a broker-dealer or investment adviser.

Alternative, they can achieve low-cost diversification and professional management by indirectly investing in the stock market through passively and actively managed mutual funds and exchange-traded funds. Competition among these funds has brought fees and expenses down to their lowest levels in history. The availability of retirement savings accounts such as 401(k) plans and individual retirement accounts also allows low-cost access to the stock market.

Now, retail investors have taken advantage of these beneficial trends over the past few decades. As Senator Toomey, mentioned, the percentage of U.S. households that own stocks—directly or indirectly—increased from 32 percent in 1989 to 53 percent in 2019. Now, low-income households saw the biggest gains over the period, but they still lag high-income households in public stock ownership rates.

Now, as we have also heard, on the other hand, the January trading frenzy in GameStop and other meme stocks and the related difficulties faced by some brokerage customers highlighted a few areas that require the SEC's and this Committee's immediate attention.

Now, the SEC has already said that they are reviewing actions taken by regulated entities to determine whether they may have disadvantaged investors or otherwise unduly inhibited their ability to trade certain securities. The SEC has also said they are investigating whether abusive or manipulative trading activity prohibited by the Federal securities laws occurred during this episode.

Having worked at the Commission for the better part of my career, I have complete confidence that the Commission and the staff will identify and pursue any evidence of noncompliance or wrongdoing. Accordingly, I focus my testimony on the market structure and infrastructure policy issues that have been raised in the aftermath of the January trading.

In summary, I recommend that the SEC should: one, evaluate whether and how to move to a shorter trade settlement cycle; two, study how payment for order flow is working in a zero commission environment with a focus on order routing and best execution requirements; three, evaluate various alternatives to increase regulatory reporting and public transparency in securities lending; and, four, consider amending the accredited investor definition to achieve more equitable access to investing in private companies across all income levels.

Now, my written testimony provides an in-depth discussion of each of these issues, and I am happy to answer any questions you may have.

Thank you for bringing attention to these critical issues and for the opportunity to testify here today.

Chairman BROWN. Thank you, Commissioner Piwowar, and welcome back again to the Committee.

Mr. Vollmer, you are recognized for 5 minutes. Thank you for joining us.

STATEMENT OF ANDREW N. VOLLMER, SENIOR AFFILIATED SCHOLAR, MERCATUS CENTER AT GEORGE MASON UNIVERSITY

Mr. VOLLMER. Well, thank you for inviting me, Chairman Brown, and to you and Ranking Member Toomey and the Members of the Committee, good morning.

My written statement makes three points, and I end with my view that what we know so far about the events surrounding the GameStop trading does not provide a sufficient basis for new legislation or regulation.

So the first topic I cover is the trading in GameStop by the users of the WallStreetBets social media forum. Based on the public information I have seen, misconduct probably did not occur in the trading of GameStop. The SEC is investigating, but my understanding is that the main group of individuals trading GameStop did not make material false or misleading statements to the securities markets and were not deceived by others.

Another concern has been whether a securities manipulation occurred. The leading definition of securities manipulation, which comes from the Supreme Court, is securities trading that is artificial or not genuine. The traders using the WallStreetBets site actually bought GameStop and the other stocks and, therefore, did not engage in a manipulation.

Let us look at the effects of the GameStop trading on the larger secondary markets for securities. At the moment, those effects do not appear to be widespread or severe. The trading activity in GameStop, AMC, and the other securities was limited to a few companies and was short term. Some investors made money in GameStop, and some lost money.

Overall, at least so far, we have not seen strong evidence of securities violations or harm to the markets for buying and selling equities on stock exchanges. There have been some questions about short sales, and I hope we are able to get into that topic during the questioning.

My second point in my written statement, I discuss the role of the broker-dealer Robinhood. It has come under scrutiny because of the WallStreetBets traders using it and because it has certain features that make buying and selling securities easier and more attractive, like commission-free trades or accounts with no minimum dollar amounts.

The criticisms of Robinhood fail to give appropriate weight to the benefits of its business model. The Robinhood brokerage service is innovative, and it makes significant positive contributions to society and the economy. It reduces costs for consumers, makes securi-

ties trading simpler and easier. It increases consumer choice and lowers barriers to participation in the market for the common stock of companies listed on stock exchanges. It, therefore, opens the securities markets and equity securities ownership to a much larger part of the population and to people with less income and wealth than are typically associated with participation in the equity markets. That is all to the good and serves a variety of goals that I have heard from everyone who is participating in this hearing.

My final point is that the information currently available has not revealed a problem of sufficient severity to justify Congress imposing new regulations in these areas. New information could change that, but any deliberations about possible additional legal restrictions Congress should give weight to and respect the personal liberty interests involved. I have not heard individual civil liberty mentioned as a factor so far today, but I think individual liberty is an important tradition in our country, and Congress should not restrain personal freedom unless it has a strong reason.

That is a summary of my written statement. I would be happy to answer questions.

Chairman BROWN. Thank you very much, Mr. Vollmer. I thank all five witnesses.

I will start with Ms. Robasciotti. Why do people get discouraged even as some stocks are going up? Do people think the market is fair? What are you hearing from your clients?

Ms. ROBASCIOTTI. You know, we hear from our clients regularly. They ask us literally the casino question, like is it actually the best way for me to save long term? And what you and I know is that they do not have any other options if we are going to outstrip inflation. And so I do see, particularly in the younger generation, an increasing set of people that do not want to participate in financial markets specifically because they do not see them as fair or efficient.

Chairman BROWN. OK. Thank you.

Professor Ghilarducci, the research on stock ownership shows, as you pointed out—and those numbers were helpful—that half of U.S. households are investing in the market; many are not. I appreciated your recounting where people's wealth—how people hold their wealth and home equity and Social Security, and that is the preponderance of wealth for most people. How does the fixation on Wall Street and stock market performance distract us from the actual economic reality for most families?

Ms. GHILARDUCCI. As I said, I teach behavioral economics, and psychologically, we are wired to look at the most recent events, and when people get rich around us, who are much richer, we see them through the lens of the media, we feel that we are afraid, and fear actually causes anxiety and might cause pulling back. It might cause coming back in. And it fuels bubbles. And as Robert Shiller's great new book says, it produces a narrative about economics and a narrative is a fiction. Stockholdings, direct stockholdings, does not create wealth, and I really appreciate what Rachel said, that we wish we had a better option. I wish everybody could be in the kinds of funds that we are in. But they will not get that by directly trading stocks.

I hope I answered your question.

Chairman BROWN. You did. Professor Fletcher, Robinhood and others brokers' business models based on selling customers' orders to large trading firms and receiving so-called payment for order flow, if these intermediaries are willing to pay brokers and provide them a service, it suggests they are getting a better deal than the broker's customers, the retail customers.

Explain why these conflicts are so problematic.

Ms. FLETCHER. Thank you, Senator Brown. So payment for order flow, just as you explained, allows some brokers to say that they are operating zero-commission trading to retail investors, and these commissions are then being subsidized by wholesalers. But the payment for order flow model undermines the relationship between a broker and their client because it pits the broker's primary revenue source directly against the clients to whom they owe a duty of best execution.

So under the payment for order flow model, brokers are incentivized to put their own profit-seeking interests above their clients' in deciding where to route orders, and this greatly undermines the broker-investor relationship, likely leaving retail investors in a worse position.

Chairman BROWN. Thank you, Professor Fletcher.

Commissioner Piwowar, I appreciate your work at the SEC in 2017 with Commissioner Stein to reduce the time it takes to complete stock transactions, reduce risk in the system. Ranking Member Toomey commented on that, too. Robinhood has suggested real-time settlement as a solution to the difficulties it had in January.

Is that realistic? What other changes would be necessary? Comment on that, if you would.

Mr. PIWOWAR. Thank you, Senator Brown, for that question. And as you pointed out, the move toward shorter trade settlements, like in 2017 from T+3 to T+2 was overwhelmingly bipartisan at the time. There were two of us at the Commission—Commissioner Kara Stein, who used to work for Senator Reed, who is on this, and myself. It was one that we viewed as a slam dunk to move to T+2.

For reasons I stated in my testimony, I think the SEC should absolutely consider moving to T+1. I am happy to go into these details. But you asked me about real-time settlement. I think that is a bridge too far at this particular point in time. As we shorten the trade settlement cycle, we reduce risks like market risk, liquidity risk, and systemic risk, but we also have the opportunity—or we have the challenge of increasing operational risk.

In order for real-time settlement to work, everything has to work perfectly all the time, and it is important to remember that the trade settlement cycle for securities does not operate in isolation. We also have to make sure the cash gets there, and that brings into account banking payment systems; it brings into account foreign exchange settlements systems for cross-border transactions; and all of those have to be calibrated to make sure that it works perfectly.

And so at this point, I think absolutely the SEC should look at shortening the trade settlement cycle, perhaps as one, but I think real-time settlement is just a bridge too far at this point.

Chairman BROWN. Thank you, Commissioner.

Ranking Member Toomey.

Senator TOOMEY. Thank you, Mr. Chairman.

Dr. Piwowar, you know, when I graduated from high school in 1980, the Dow Jones Industrial Average had a low that year of 759, and it traded at a high of about 1,000. The last time I checked this morning, the Dow was at 32,000. And I guess my question for you is: If a retail investor took whatever amount of savings he or she could and regularly invested in a broadly diversified portfolio through whichever mechanism, and did that over these last 40 years, is it likely that that investor would have earned very substantial returns on those investments? Or is it more accurate to think of the stock market as a zero-sum casino where that middle-income American is going to lose because there is a hedge fund out there somewhere that wins?

Mr. PIWOWAR. Yeah, thank you for that question, Senator. As Andy Vollmer pointed out in his testimony, the returns that retail investors get from long-term investing is exactly the same as an institutional investor who invests in the exact same securities. And what we know for long holding periods is that, you know, on average, the stock market tends to go up.

There are daily fluctuations, there are minute-by-minute fluctuations in individual securities, but what we know is that retail investors who hold diversified positions in low-cost mutual funds and other mechanisms over long periods of time will do quite well in increasing their wealth.

Senator TOOMEY. And those low-cost options are lower in cost and more available today than ever before. Isn't that true?

Mr. PIWOWAR. That is correct. You know, since the time that you graduated in 1980, not only do investors have the opportunity to invest in open-end mutual funds, but a new innovation, exchange-traded funds, has entered the landscape and has brought incredible competition to this industry and brought fees and expenses to their lowest rates in history.

Senator TOOMEY. Right. A quickly follow-up on the faster settlement cycle. I understood you to say that there might be some challenges, technical challenges, in real-time settlement. But would you distinguish between real-time settlement and same-day settlement? And do you think that it is feasible to move to same-day settlement? Or do you think we really should be happy with T+1 rather than the T+2 we have today?

Mr. PIWOWAR. Thank you for that question. First of all, I think what the SEC should do, which is what we did when we evaluated moving from T+3 to figure out should we go to 2, to 1, or real-time settlement, was we took a look at the way the world existed in terms of the markets and technologies 4 years ago, and we said let us look at it on a cost-benefit analysis. And we said, all right, in terms of moving from 3, do we get any benefits? And what are the costs from going to 2 to 1 or real-time settlement?

At that time, 2 was the clear winner. What we heard from the industry was that the cost would be low. It would be pretty much speeding up existing back-office products. Then we heard from buy side, sell side, the clearinghouse, exchanges, even retail investor brokers and securities traders.

Moving to 1 had additional challenges. Not only the costs were higher, but as I mentioned in answer to Chairman Brown, you

have to get the bank regulators involved to make sure that all the bank payment systems also line up so that you make sure that they settle correctly.

Moving to zero, you know, at that time, whenever we asked people, said, "Well, how do you get to real-time settlement?" and the answer was always, "Blockchain." And we said, "Well, can you explain how that workers?" And they would just repeat back louder, "Blockchain."

And so we may get to a point where blockchain technology or digital ledger technology gets us to a point where we can achieve real-time settlement, but I do not think we are there just yet. That is just my opinion.

What I think the SEC should do is put out for public comment a rule proposal proposing to move to a shorter trade settlement cycle and put it out for public comment and evaluate the costs and benefits.

Senator TOOMEY. Thanks. And, Mr. Chairman, if I have time for one more quick question?

Chairman BROWN. Yes, proceed.

Senator TOOMEY. Mr. Vollmer, recently the CEO of Robinhood testified that the restrictions that they imposed on purchasing GameStop and a few other stocks were driven by margin requirements required by the DTCC in compliance with the SEC's capital rule. So two questions.

One, is that a plausible explanation in your mind for the restrictions they put in place? And, two, is it really optimal to have the opacity about how those capital rules work that prevent us from knowing clearly in advance exactly what they are?

Mr. VOLLMER. Thank you, Senator Toomey. I think the explanation that I heard from the CEO sounded reasonable. The collateral call from DTCC was sudden and in a large amount. That took Robinhood by surprise and caused them to impose trading restrictions. By the way, the trading restrictions were only one way, only on buys, not on sells. So customers could sell. They entered into the discussions. They talked to DTCC. They reduced the collateral call because they had imposed these trading restrictions.

The SEC is in a position to look at these areas to see if the process could be improved and smooth, because I agree with the theme in your question, and that is, I do not think either Robinhood or the customers should have been taken by surprise quite as much as they were, and if there is a way that we could smooth that out, I think that would be better for the broker-dealers and better for the markets.

Senator TOOMEY. Thank you very much.

Thank you, Mr. Chairman.

Chairman BROWN. Thank you, Senator Toomey.

Senator Menendez is recognized.

Senator MENENDEZ. Thank you, Mr. Chairman.

Dr. Fletcher, I want to follow up on the questions that the Chairman raised with you in terms of order flow issues. Doesn't it create a conflict of interest or at least an appearance of a conflict when a broker receives a payment from a third party—in this case, a market maker—to fulfill their customers' orders?

Ms. FLETCHER. Thank you for that question, Senator. Yes, it absolutely creates that conflict of interest because brokers are now—with this payment for order flow model, brokers are incentivized to put their own profit-seeking interests above the interests of customers when deciding where or how to route these orders.

This also should raise concerns for us in terms of customers being able to get the best execution from their brokers. And so, yes, I agree with your question that this does raise these questions for us.

Senator MENENDEZ. And so how does an investor know that their broker is working to find the best execution quality for their investor, not simply working with the market maker that pays them the most?

Ms. FLETCHER. So currently under SEC rules, there are some disclosure out—there are disclosure obligations on retail brokers to state what their price improvement is from having routed their orders through different—to different wholesalers or market makers. But the retail investor really has very little information in terms of knowing the price at which their order is executed or what exactly that price improvement was. So retail investors do have less information, and so we do need more or better disclosure for retail investors to be able to evaluate this information.

Senator MENENDEZ. Are there other costs that payment for order flow imposes on investors?

Ms. FLETCHER. One of the things that we want to probably be thinking about with regards to payment for order flow is whether or not retail investors are truly receiving a best execution when they are trading, meaning if there are quotes that are—so, for example, there are quotes that are available that are odd lot quotes that are typically not included when we think about what the best price is available for an order. And right now one of the things that I would recommend is that the SEC think about amending some of their rules to include these odd lot quotes such that truly the best price available is included when we think about the execution of more retail investor orders.

Senator MENENDEZ. Thank you. I would like to turn our attention to racial inequity in the stock market. Historically, stock ownership has been dominated by white Americans. According to the Federal Reserve, in 2019, only 34 percent of Black families and 24 percent of Hispanic families owned any equities compared to nearly 61 percent of white families. This disparity only grows larger when you look at the value of equities held. Among families with equity, the typical white family has over $50,000 in holdings compared to just over $14,000 for a typical Black or Hispanic family.

These equities represent funds that families can tap into in emergencies such as the pandemic. We have ample data showing that the pandemic is having a disproportionate effect on minority families, and the lack of savings is one reason why.

Dr. Ghilarducci, what are the consequences of disproportionately low participation in the stock market by Black and Hispanic families? And what are some of the challenges holding back minority families from owning equities?

Ms. GHILARDUCCI. Thank you so much for that question. A lot of my research at Notre Dame has been on non-white families with anthropologists exactly exploring that question.

What holds non-white families, Blacks and Hispanics, from having wealth is not having access to a retirement plan at work. Wherever these families have significant holdings, meaningful holdings in stocks and bonds and private equity and the kind of wealth that we have because we are workers who have a retirement plan at work, they do not have because of their workplaces. So if we worked to expand retirement coverage to all workers through an innovative pensions-for-all plan, they would have less.

Senator MENENDEZ. One last question, Dr. Ghilarducci. Is the lack of stock ownership among minority families an impending factor in their ability to build wealth?

Ms. GHILARDUCCI. Absolutely. They need Social Security, they need home equity, and they need access to financial instruments, but through professionally managed funds, not through trading on their phone.

Senator MENENDEZ. OK. Thank you very much.

Chairman BROWN. Senator Shelby from Alabama is recognized for 5 minutes.

Senator SHELBY. Thank you, Mr. Chairman.

I want to take a second here and welcome again Dr. Piwowar back to the Committee where he spent a number of years before he was a member of the Securities and Exchange Commission itself. Thank you for being here with us today.

I have a question for you following up on the area that Senator Toomey was involved in. I have always asked about cost-benefit analysis, how important that is when you are dealing with a new regulation or a proposed regulation. What has the SEC adopted a number of years ago and what do they do today when they are looking at a regulation, Dr. Piwowar?

Mr. PIWOWAR. Thank you, Senator Shelby, for that question, and thank you for your warm welcome back to the Committee. It is great to see you and the other members of the Committee again.

I think you are referring to the current guidance in economic analysis——

Senator SHELBY. Absolutely.

Mr. PIWOWAR. ——that the Commission adopted in 2012. So then-SEC Chairman Mary Schapiro decided to enhance the role of economic analysis at the Commission. It was due in response to a couple things.

One, the Commission had lost some well-publicized cases in the courts for not following—doing proper cost-benefit analysis in accordance with the Administrative Procedures Act and some of their own statutory requirements. And, two, part of it was your leadership in terms of making sure that as the regulator implemented the various Dodd-Frank provisions, that they were doing cost-benefit analysis to evaluate how they were going to move forward.

What the guidance did was essentially give the Chief Economist at the Commission more authority over the rulemaking process, got the economists involved earlier in the rulemaking process to help standardize how they think through the rules. And so what it does is it forces the Commission to go through a very important exercise

of saying, all right, what is the justification of why you are thinking about going forward? It could be a mandate from Congress, or it could be a discretionary choice based on the fact that markets change. It forces them to adopt a baseline for the status quo, and then to look at various alternatives and evaluate each of those alternatives in terms of the costs and benefits, and that will then point them in the direction in terms of which is the most appropriate way for the Commission to move forward.

That guidance has been followed by every Chairman, both Republican and Democrat, and I was heartened to see in response to your question at the nomination hearing last week that Gary Gensler, if confirmed, would also continue to follow that guidance.

Senator SHELBY. Would you give us just a thumbnail sketch of if there is a proposal to come forth with a regulation, a mandate by the SEC dealing with the current problems, you know, order placement and so forth, what would be the steps to do this? How would you go about that if you did?

Mr. PIWOWAR. Yeah, thank you for that question. That is one of the great things about the regulatory process that we have, is it provides for valuable input from the public. So, first of all, the SEC would decide whether they want to put a rule proposal out; or maybe they are not there yet, maybe they are still contemplating whether to put out a formal rule proposal, so they could do a request for comment. And then what the SEC does is it puts out and provides to the public their own economic analysis in terms of what they think the costs and benefits are, and then they ask explicit questions of the public and ask them questions like: Did we get this right? Do you have any other numbers that would support or contradict our finding? Or do you have any other numbers that would help us make this decision?

It is a very public process. They go through open meetings. The public can participate. It is on their website. Anybody can submit comments to this process. And then the procedures and the statutes that the SEC has to follow, they have to take into account those public comments. Then they go back and reformulate their economic analysis with this new information, and they can choose to either move forward, not move forward, or move in a different direction. So it is a very robust process.

Senator SHELBY. One question to Mr. Vollmer. Mr. Vollmer, in your opinion, did Robinhood perform in a rational, thoughtful way in dealing with their situation when everything was a little frenzied?

Mr. VOLLMER. Senator, they certainly reacted in a rational way, and they were as thoughtful as time permitted them. But they were under a great deal of time pressure with the sudden collateral call. And so they reacted quite well, and they did impose the trading restrictions, which they did not want to do, but they tried to relieve those when they could. But they collected collateral that they could put up to DTCC very rapidly.

Senator SHELBY. Mr. Chairman, thank you very much.

Chairman BROWN. Senator Tester from Montana is recognized.

Senator TESTER. Well, thank you, Chairman Brown, and I want to thank you and Ranking Member Toomey for holding this hear-

ing. And I want to thank everybody who has testified. I appreciate all of your time, and thanks for being here.

We have known for a long time that there are perverse incentives in our systems and that those systems influence where companies make investments, and sometimes more importantly whether to make cuts. Many of us here agree that there would be benefits to a system where companies focus on the long term and helping their communities and their workers not just on short-term profits.

Now, I want to be clear. I do not feel bad for those who have lost money trying to game the market. But I am worried about those regular folks who saw this and tried to get in on something like this and then get hurt.

The recent market volatility presents an opportunity to take a really hard look at our securities regulations and the systems that we have in place. Investing in companies in the stock market should not be something that can only be gamed by the wealthy. I think we all agree with that. So it is my view our system should work for everybody that is trying to invest in their future.

So it seems to me that something is not working here for companies and communities, and especially the retail investor.

So this question is for all of you, and I will ask you to try to make it short. Some of you have already addressed part of this. But if you were able to make any changes and were in charge of all of the decisions, whether that is in Congress or at the SEC and SROs everywhere, what would you do to approve how our system works for retail investors? And you can just go in the order that you presented your testimony.

Ms. FLETCHER. Thank you so much, Senator, for that question. So the thing that I would want to make our system work better for retail investors is better information for our investors as to what the true costs are for their trades and for the transactions that they are engaging in. Too many investors see this zero commission model and think that it truly is zero commission, and I think that there is information that they would need to truly evaluate the costs and the risks of these transactions.

Senator TESTER. Thank you.

Ms. ROBASCIOTTI. Thank you for your question, Senator. If I could do one thing, it would be to impose a financial transaction tax. I believe that that is a very negligible cost to the everyday investor, and it is something that would stop the high-frequency traders from dumping gasoline onto the already roiling fires of mistakes or other market disruptions that come about.

Senator TESTER. OK. Just to be clear, the tax would be put on for the purpose of stopping the high-volume folks, correct?

Ms. ROBASCIOTTI. Yes, I believe the tax—the purpose of the tax is to add an additional cost, and that additional cost would be an invitation for deliberation, which I believe is something that investment decisions always benefit from.

Senator TESTER. Thank you. Next?

Ms. GHILARDUCCI. Three things. The economic analysis should include behavioral economic analysis at the SEC. They should look at the way that the phone app looks like and to cut out the obvious

addictive aspects of the games. Economists should be smart about that.

Second, I agree with Dr. Fletcher that there should be a revelation just like we do in professional investing, what the true costs are.

And, third, Nobel Prize economists back up what Robasciotti just said, that sand in the works, slowing down the trading with a securities tax would help make the market work better.

Senator TESTER. OK. Next?

Mr. PIWOWAR. Thank you, Senator Tester, for that question. So a few things.

One, we already talked about, I think, shortening the trade settlement cycle would help everyone, allow retail investors to get access to their funds quicker, but also take risk out of the system.

Second, amending the accredited investor definition to achieve more equitable access to private companies across all income levels.

And, third, just a general one: better disclosures for investors. As you know, the SEC is a disclosure regulator, and so one of the most important things that the SEC can do is provide—is arm investors with information to make informed choices. And so one example of that, you know, Professor Fletcher had mentioned better information about order routing and best execution. I wholeheartedly agree. In my written testimony, I attempted to look to see whether Robinhood customers in particular, how their order executions were done, and, unfortunately, with the publicly available information, I could not do that directly. So I think better, more granular information about how and why brokers are routing their trades and the outcome from that could go a long way to protecting investors.

Senator TESTER. Mr. Vollmer.

Mr. VOLLMER. Thank you, Senator. I will be quick. Two things. First, reduce the cost and complexity of public offerings.

Second, I am in broad agreement with Mike Piwowar. In private transactions, the difference between accredited investors and non-accredited investors should be eliminated, and instead in certain private offerings, there should be required short-form core disclosures.

Senator TESTER. Thank you all.

Thank you, Mr. Chairman.

Chairman BROWN. Thank you, Senator Tester.

The Senator from North Carolina, Senator Tillis, is recognized.

Senator TILLIS. Thank you, Mr. Chairman. And thank you all for being here. I have been in and out of this Committee. I have got two other committee meetings going on at the same time, so I am sorry I have not been here for all of your testimony.

I was here after Senator Shelby's and Senator Tester's questions, so I want to get right to the financial transaction tax. I know that that has been something that has been offered up in the wake of the Robinhood/GameStop saga. But there seems to be—I am trying to understand how we can avoid what appears to have been the consequence for financial transaction taxes that have occurred in other jurisdictions and then some countries have thought about it and backed off of it based on these experiences.

Reputable studies indicate that the FTT would actually reduce the value of a typical investor's 401(k) and maybe as much by 8.5

percent in the lifetime of savings. That looks like people may have to work an extra 2–1/2 years to make that up, to realize the same amount of savings.

So do you disagree, Professor Ghilarducci, that it would have that effect on potential savings?

Ms. GHILARDUCCI. Thanks a lot for bringing up that research, Senator Tillis. It is really pertinent. That data is a bit out of date, and it also is distorted. If 401(k) traders or pension funds traded all the time, the tax would reduce their savings. Also, that study was done on a tax that was much higher than the kinds of taxes that are produced now.

It is well known in the economic research that if you get the tax low enough, you do not hurt long-term investors, but that you slow down the high-frequency trading. So it has to be done right, but it is backed—the good effect is backed by many, many studies, not just that one study you are citing.

Senator TILLIS. Thank you. I know that CBO projects the FTT would result in a $43 billion, almost $44 billion first-year net loss of tax revenues and would immediately lower the value of financial assets. Are you just saying that these studies have set the mark too high? And so, in your opinion, what is the sweet spot that you think would actually affect the high-volume investors but not affect the individual investors that now a substantial number are in the market?

Ms. GHILARDUCCI. I just read a dissertation that had that number, that sweet spot—that is a really excellent question—meaning I will have to get back to you with what that number is, but there is a number. And the CBO study looks at the short-term effects. People will not be trading and realizing those capital gains, but we actually do not want them to. We want them to hold those gains longer. So I will get back to you with that number.

Senator TILLIS. Thank you.

Mr. Piwowar, thank you for being here, and I am sorry our time is limited. I will not be able to ask questions of all of the witnesses. But am I correct that the act of frontrunning that some worry market makers could engage in is already illegal?

Mr. PIWOWAR. That is correct.

Senator TILLIS. So should the discussion be more around enforcement of what we already have on the books, or do you think we need to go further than that?

Mr. PIWOWAR. No, I think you are absolutely right. I think it is enforcement of what we already have on the books, right? And so if I may just go into a little more detail on that, there is an inherent conflict of interest when—in the presence of payment order flow, and the SEC explicitly recognizes that, and that is why we have best execution requirements, and that is why the SEC actively enforces those best execution requirements. And also, if I may, if the SEC works a band payment for order flow, we would likely go back to commission trading. It would cost to trade. And what that does is it does not eliminate a conflict of interest; it just changes it.

So when I was in the private sector, I worked for an economic consulting firm, and we provided expert witness testimony on behalf of plaintiffs in the FINRA arbitration context where brokers

were churning the accountable of their customers. And so simply, you know, getting rid of payment for order flow just moves the conflict of interest, and, again, it has to be done through enforcement.

Senator TILLIS. Thank you very much.

Thank you, Mr. Chairman.

Chairman BROWN. Thank you, Senator Tillis.

Senator Warner of Virginia is recognized.

Senator WARNER. Well, thank you, Mr. Chairman, and I want to pick up where my friend Senator Tillis left off, and I want to start with Professor Fletcher, but I would like to hear from Michael on this as well.

On this question around payment for order flow, I think, you know, we have now seen evidence that about $6 billion of payments to brokers and others within the payment for order flow, I remember, gosh, it has probably been 7 or 8 years ago, the Royal Bank of Canada had a chart that kind of blew me away about the bespoke nature of all this order flow payment. I think it is extraordinarily not transparent. I think $6 billion generates an awful lot of profits, I think particularly when you have got only a few major firms that are on both sides of the trade around payment for order flow, and I want Michael to comment on this, but it really seems out of whack to me. And the argument that says payment for order flow is to increase liquidity, it just does not seem to be the case. I mean, if you look at the fact that of the 9,000 securities that are traded, the top 10 percent, less than 1,000 of them, account for about 77 percent of all that liquidity, it would say to me that, you know, you do not need that payment for order flow to increase liquidity because you have already got liquidity.

And I guess I would start with you, Professor Fletcher. I think you have raised these issues as well. You know, we see large enterprises with Fidelitys and Vanguards that do not make payment for order flow, has that decreased liquidity? Why wouldn't we—if we need liquidity payment, why wouldn't we pay for, say, the bottom—payment for order flow for the bottom 90 percent but not the top 10 percent? And have we seen in countries like the U.K. and Australia, which have banned payment for order flow, any decrease, significant decrease in liquidity? Why don't we start with you, Professor Fletcher? I have worked with Michael in the past around here. I know he has got a different view. But, Professor Fletcher, would you start?

Ms. FLETCHER. So thank you so much for that question, Senator. So in terms of the impact of payment for order flow on liquidity, I do not think that payment for order flow is needed for us to achieve liquidity. We have a deep financial market that we have had before payment for order flow, and just as you noted, there are jurisdictions, such as United Kingdom and Australia, which have banned payment for order flow. And research that I read from the United Kingdom recently has not indicated that there has been any meaningful decline in their liquidity.

Indeed, what that research has demonstrated is that there has been better execution for retail investors at the best price in the absence of payment for order flow. So that would indicate that there is less conflict and investors are able to get better price execution in the absence of payment for order flow.

Senator WARNER. And we have not seen—by the way, if you are a Fidelity or Vanguard customer where they are not paying payment for order flow, are they getting less good execution terms than other retail investors?

Ms. FLETCHER. So the problem with that, Senator, is that we do not have information to even know that, right? And so one of the—this is something that I believe that we have some consensus about in this hearing, is that we do not have enough information to know whether or not retail investors like Fidelity that does not do payment for order flow have a better or worse execution than our retail investors with other brokers that do have payment for order flow. And so that is a point at which we do need more and better information.

Senator WARNER. And I would say that I fear—I have talked to our friends at Robinhood, and I have spent some time looking at this. I really do fear—and I am all for democratization of our market system, but increasingly I fear that oftentimes these retail investors are, frankly, not customers. I think they are the product, a la many of us being the product for Facebook. And I think we are—oftentimes that product is manipulative.

Michael, I want to give you a chance to respond to this. It just seems to me that—and I know the excuse is always the way you get to no-cost, you know, lack of brokerage fees, but, obviously, some of the large enterprises were able to do this without that payment for order flow, and I think there are inherent conflicts. In that last 10 seconds, do you want to give a bit of a rebuttal to my point?

Mr. PIWOWAR. Yes, thank you, Senator, for giving me 10 seconds to respond to that. I would start with agreeing with, again, Professor Fletcher, that this is an empirical question, right? The concerns that you have raised on the payment for order flow side are the same concerns that people have raised on the churning side when in the presence of commission-based trading. And it is ultimately an empirical question, and, unfortunately, right now we just do not have the data for that. And so that is why I think it is important for the SEC to consider getting better data, getting better transparency in this so we can actually evaluate what the proper policy alternatives or policy choices are.

Senator WARNER. I know my time is up, but, Mr. Chairman, I hope we would look at some of the questions around best execution, because I think I actually frankly have seen some evidence that there is some manipulation going on there, and it would be a subject that would be well worth this Committee looking into.

Thank you, Mr. Chairman.

Chairman BROWN. Thank you, Senator Warner.

Senator Hagerty from Tennessee is recognized for 5 minutes.

Senator HAGERTY. Chairman Brown, Ranking Member Toomey, thank you for holding this hearing today.

As noted, this hearing is an important part of Congress' oversight of our capital markets, and it is also a great opportunity to reaffirm support for retail investors' participation in United States capital markets and for maintaining our markets' fairness, our order efficiency, and global competitiveness.

Before turning to the specific market events that led to this hearing and the potential areas for improvement, we must not lose sight of the fact that our financial markets are the envy of the world, and for a very good reason. They are the most robust, most efficient, and they deliver the greatest liquidity and funding at the lowest cost of capital. They finance our great economic opportunities by connecting retail and institutional investors with American individuals and families that are looking to achieve the American dream, including higher education, homeownership, and financial security in their retirement, and with our great businesses that need capital to thrive.

Our vibrant capital markets play a vital role catalyzing the economic growth of communities across America. We must not forget that, particularly as our economy is recovering from a pandemic-induced recession. Now is certainly not the time to impose unnecessary constraints on our capital markets and market participants that would only slow America's recovery from the pandemic.

Mr. Piwowar, I want thank you for your testimony. Today may be the golden age of investing for retail investors. I say "may" only because with the pace of our financial technology innovation, who knows what tomorrow will bring? Major brokerages now offer zero commission trading, but they must continue to follow all legal obligations to serve their customers.

Reams of financial and trading data can be immediately accessed at the touch of an app, and while stocks may not always go up, our major indices have repeatedly hit record highs over the past 4 years, in large part due to solid pro-growth policies.

So, Mr. Piwowar, having said that, many investors were caught off guard when Robinhood temporarily halted trading of certain shares. As a result, a lot more people now know about short selling, margin trading, clearinghouse deposit requirements, and settlement times.

Do you agree that the SEC, again, working together with the private sector, can accomplish more by focusing on investor education rather than engaging in just simply more Government paternalism?

Mr. PIWOWAR. Thank you, Senator Hagerty, for that question. I think in terms of the SEC's authority, I think the SEC already has all of the regular authority it needs to address a number of the issues that I identify in my testimony.

In terms of investor education, yes, it is extremely important. As I mentioned, the SEC is a disclosure agency, and one of the things—you know, as being one of the non-lawyer Commissioners at the SEC—that I worried about what that, you know, a lot of the disclosures were written by securities lawyers and only understandable by securities lawyers. So that is why I spent a lot of time with our Office of Investor Education and Advocacy to make sure that we are getting the word out to investors.

I also spent a lot of time working with our team that was given the authority—or clarified the authority in Dodd–Frank that the SEC could engage in investor testing and actually go out and do focus groups and surveys to make sure that the information that the SEC was giving to investors was understandable and digestible.

And then, finally, I would just add that when I was Acting Chairman, one of the major personnel changes I made was to add a position specifically focused on military outreach. One of the things that had happened during that time was that the military was moving from the old pension system to a defined contribution program, the TSP program that Professor Ghilarducci mentioned. And I had the opportunity to meet with some of the sailors on the USS Carl Vinson, and some of these sailors were fantastic at, you know, launching and catching planes landing on the aircraft carrier, but they did not know the first thing about investing for their future. And so we embarked on a specific initiative to make that information available to them and talk to them about the power of diversified, low-cost savings for the long term, the matching services and saving for their retirement, and I am happy to say that that has been a very successful initiative.

Senator HAGERTY. In the minute we have left, are there any specific actions that you would suggest for our retail investors today as you look at the evolving markets that we are in and the challenges ahead of us? Any specific guidelines that you would propose or suggest for our retail investors?

Mr. PIWOWAR. Yes. It would be the same advice that I gave when I was a professor of finance, which is: Do your homework. There is an incredible amount of information that is out there for investors that we have never had before, whether it is on the Internet or whether it is through educational institutions and the like. And if I may talk a little bit about gamification, I am not a Robinhood customer. I have never seen the app. I do not know what type of gamification is involved there. But I do know that using games and simulations is a very effective way of educating students. I note that many business schools are moving away from the traditional case method and lecture method to move toward simulations in trading, and even in cybersecurity, training the next generation of folks working in cybersecurity, it is all through games.

So in terms of gamification, I urge caution in throwing the baby out with the bath water and that gamification could be used for effective education.

Senator HAGERTY. You got it. Thank you very much.

Chairman BROWN. Senator Warren was having technical issues. Is she able to join us?

We will come back to her. Senator Van Hollen of Maryland is next.

Senator VAN HOLLEN. Thank you, Mr. Chairman, Ranking Member Toomey. And to all our panelists, thank you for your testimony today.

We know that Wall Street has made an art of high-frequency trading and rank speculation that has fattened the wallets of a few while putting everyday investors at greater risk, and the market events of last January brought attention to Robinhood's practice of selling user data to hedge funds that do high-frequency trading.

As has been mentioned today, one way to deal with that and cut down on high-frequency trading and its risks to market stability would be to place a small fee, say 0.1 percent, on these Wall Street transactions. It would generate billions of dollars that we could invest in greater opportunity for other Americans. It would reduce

wealth and economic inequality and reduce volatility in the market. That is why Senator Brian Schatz and I plan to shortly reintroduce our bill to impose a financial transaction fee, a high-roller fee, and let me start with Ms. Robasciotti. I know you mentioned this. Could you just elaborate a little bit more on, first of all, the risks of high-frequency trading; and then, second, how a financial transaction fee of the kind I am talking about could reduce that and be a benefit?

Ms. ROBASCIOTTI. Certainly. Thank you so much for the question, Senator. I am happy to hear that you will be reintroducing that legislation.

In terms of the risks, I mostly see them as systemic. When we have that classic recipe for market disruptions, what we have seen time and time again, whether it is the Great Recession or the flash crash, is that high-frequency trading simply exacerbates that.

In terms of how the financial transaction tax actually shows up for regular Americans, if you will allow me, I would like to use myself as an example. I was born into rural poverty in a segregated town. I grew up in an all-Black family. We were very poor. I have been homeless multiple times as a child. Thankfully, I graduated at 15, went to college. Any of the extra money that I have made in my entire working career has gone either to my extended family or back into my business. But at the age of 42, I have managed to save $100,000 in my retirement account.

I was looking at my average trades, and my average trade size is about $9,000 on my own account. If the financial transaction tax that you are talking about of 10 basis points or 10 percent of 1 percent were to come about, that would cost me about $9 per trade, and I have about 20 trades per year. And this is very similar to the situation that is true for most of my clients; $9 is less than the $9.95 that the discount brokers were charging when they were actually charging and trading—when they were charging the commissions for trades. And so to me, that seems very reasonable as a small amount of insurance for the price that I pay as a participant in an orderly, fair, and efficient market. And one of the ways that I know that that is happening is because it is significantly slowing down the non-human algorithmic high-frequency trading that has caused so much damage.

Senator VAN HOLLEN. Well, I appreciate that. As you say, it really would create a disincentive, a financial disincentive for that high-risk conduct that puts other people in the market at risk.

Professor Ghilarducci, you also mentioned this. Could you just elaborate a little more? Because this is going to be a big debate. I think as we consider different options for revenue, this will be an attractive one because, in addition to raising revenue, it has these other benefits. Could you just talk a little bit more about that?

Ms. GHILARDUCCI. Right. I think the economic research has been done. It is an idea whose time has come, especially if you reintroduce your bill. The costs and benefits have been evaluated since James Tobin at Yale in the 1970s proposed it. And economist after economist have rerun the numbers, and if it is too high, it will have bad effects on long-term savings. If it is too low, it will not have any effect. If you get it just right—and, actually, 0.1 percent is about right; thank you for reminding me of that—what it does

is it shifts from high-frequency trading—it changes behavior—towards more long-term holdings, exactly where all of us want people to be with their stocks.

So I think you are on very solid ground in terms of the academic research, that the costs are too high of a tax, and the benefits of just the right one encourages wealth accumulation.

Senator VAN HOLLEN. Well, thank you. I look forward to following up with you and others on the panel as we shape this and have the debate. Thank you all very much.

Thank you, Mr. Chairman.

Chairman BROWN. Thank you, Senator Van Hollen.

Senator Cramer of North Dakota is recognized for 5 minutes.

Senator CRAMER. Thank you, Mr. Chairman. And thank you to our witnesses. Like Senator Tillis and several of us, I apologize for coming in and out of the hearing while we cover other hearings, but I am grateful, so bear with me if you have answered this several times.

Dr. Ghilarducci, I wanted to get real basic with you if I can. In your testimony you stated the following, and I am going to read you the quote: "We need innovations in public policy to give more Americans access to what we know works—professionally managed retirement coverage that allows everyone to benefit from the stock markets the same way you and I do in [TSP] . . . in a defined benefit plan . . . [TIAA]" and so on.

Just so I am really clear, do you believe that all Americans should be required to pay for investment advice?

Ms. GHILARDUCCI. Investment advice. I think all Americans should be in a retirement account—oh, I see, and so if you are in a retirement account——

Senator CRAMER. Should they have to pay for it?

Ms. GHILARDUCCI. ——you are paying for investment advice. You know what? Americans should have access to investment advice that is worth it. A lot of investment advice they get is from conflicted investors, and that is not good. But if we are going to hold our pension fund money in stocks, the advice about where to put it should be high value.

Senator CRAMER. And high value being high price, I assume.

Ms. GHILARDUCCI. No, well, just that the cost—the benefits from the cost, you know, outweigh it.

Senator CRAMER. Sure. All right. In some sense, this whole hearing is obviously fundamentally about the level of access that retail investors should have to own shares of companies, right?

Ms. GHILARDUCCI. Yeah.

Senator CRAMER. Some of your positions is that the system is rigged, that it is a casino. We have heard all the terms. Investors should have to rely upon professional advice for a fee to have access.

Let me ask you, Mr. Vollmer and Mr. Piwowar, do you believe retail investors in the marketplace benefit from direct retail investor access to the market? And if so, why?

Mr. VOLLMER. Shall I go first, Mike?

Senator CRAMER. Go ahead.

Mr. VOLLMER. I think that retail investors benefit hugely from direct access to direct ownership of the equities of operating compa-

nies, but they should do it with their eyes open, as Mike Piwowar said, and accept responsibility for the consequences. It is not a casino. The securities markets are not a casino. They have risk. There is significant risk to them. But as people have pointed out, stock markets in the medium and long term produce positive returns. Casinos, if you are in the medium or long term, you will lose money.

So, yes, they ought to have direct access, but they ought to be smart about it and recognize their limitations. And, clearly, investing in mutual funds or index funds is by far the better approach for nearly all retail investors.

Senator CRAMER. Including me, by the way.

Mr. Piwowar, would you have anything to add to that?

Mr. PIWOWAR. Sure, I agree with everything that Mr. Vollmer talked about. What I would add to that is it is important for investors to have the choice to do both, right? They have access to indirect investments through low-cost, professionally managed funds, and then investors have the opportunity to invest some of their money on their own, do their own homework, do their own due diligence on the firms. And over time what that does is, whether it is through wins or losses in the stock market, they learn. It gets them more engaged in the stock market.

You know, as I mentioned, in business schools we do—back when I was teaching, we even started doing some simulations in terms of, you know, paper money portfolios. And it is amazing how much students get involved in terms of the stock market and learning about companies when there is, you know, pretend money or real money on the line. So I think it really provides the opportunity for people to learn over time about the financial system.

Senator CRAMER. I appreciate that. I appreciate all of you, really. Every time I participate in one of these, I keep thinking, speaking of schools, several of you are professors or at least have been or get to be on an adjunct basis every now and then. I just think every business school ought to take some Senate hearings like this and just play them for students, because I think there is a lot to be learned. So I am grateful to all of you.

Thank you, Mr. Chairman. I yield back the rest of my time.

Chairman BROWN. Thanks, Senator Cramer.

Senator Warren from Massachusetts is recognized for 5 minutes.

Senator WARREN. Thank you, Mr. Chairman.

So in recent weeks, I sent letters asking questions of those at the center of the GameStop market chaos, and I have received responses from the SEC, FINRA, Robinhood, and Citadel, the giant hedge fund. I ask that those responses or lack of responses, Mr. Chairman, be entered into the record. Without objection? Mr. Chairman?

Chairman BROWN. I am trying to unmute. I did not see that coming, Senator Warren. Without objection, so ordered.

Senator WARREN. All right.

Neither side advertised it publicly, but Citadel Securities was Robinhood's go-to partner for handling retail trades. At the height of the GameStop trading mania, Citadel alone was handling more volume than all of Nasdaq. And while Citadel was raking in cash from executing GameStop trades with one hand, its hedge fund af-

filiate was bailing out another fund on bad GameStop bets with the other hand.

So I asked questions about Citadel and its relationship with Robinhood because this gets at the heart of what is wrong with Wall Street. It is riddled with conflicts of interest that allow the giants to win every single time.

Here is some of the information that Citadel would not provide: how much money Citadel made from GameStop trades; what information on trades Citadel receives from Robinhood about GameStop and about millions of other trades; and then how Citadel uses that information it gets, whether it passes it along to its affiliates, to make even more money.

Professor Fletcher, is this information important for understanding the role that Citadel played during the recent GameStop volatility? If, say, Citadel has executed the overwhelming majority of GameStop trades during the turmoil or had been receiving an information advantage from executing Robinhood orders, could that potentially hurt retail investors?

Ms. FLETCHER. Thank you, Senator Warren, for the question. Yes, so to just go right to your question, yes, this information about Robinhood and other retail brokers' customers trading is definitely essential to our understanding of these recent market events.

One of the things that we know is that Citadel does receive lots of information about customers' orders from Robinhood, but it would also be important to know whether and how that information is being used by Citadel and others in order to have a clearer understanding of the recent volatility and any role that they may play in the swings, in the price swings that the stock price experienced.

Senator WARREN. Thank you. You know, Robinhood gets more than half of its revenue from collecting fees for pushing its customers' orders to outfits like Citadel, and Citadel makes its money off the spread. They pocket the small difference between the buy and sell price of the trade, and—this is important—Robinhood also receives a percentage of the spread on each trade.

So, Professor Fletcher, both the number of transactions goes up and the spread tends to widen during periods of market turmoil. So am I understanding correctly that when share prices for GameStop or any other company undergo extreme swings, Citadel and Robinhood both stand to make more money while investors pay more to trade?

Ms. FLETCHER. Yes, Senator Warren. This is generally what happens in times of stress, and so it is also important to keep in mind that market makers like Citadel are both in the exchange trading markets and executing huge volumes of orders off the exchanges. So while pension funds and other institutional investors generally cannot interact with retail customers and retail customers are siphoned off and prevented from interaction with institutional investors, Citadel sits in the middle and is able to interact with all of them. And this benefits Citadel by being able to segment the markets in this way, which dilutes the number and quality of orders that we see on the exchanges. And the profitability is there for Citadel for doing so.

Senator WARREN. Right, and this is why the SEC needs to investigate the GameStop run-up. The stock market is supposed to be about capital formation creating long-term value for companies so they can grow and create jobs. This is good for the American economy and for American families. But when big sharks like Citadel and Robinhood come out ahead no matter what happens and when the information they gather is not disclosed and when it is secret how that information is used, it is easier for these giants to skim off the top at the expense of small investors and working families.

The SEC's job is to provide transparency about these companies' market tactics and make sure they do not rip off customers. They could start by following up on my questions to Citadel and Robinhood.

Thank you, Mr. Chairman.

Chairman BROWN. Thank you, Senator Warren.

Senator Cortez Masto from Nevada is recognized for 5 minutes.

Senator CORTEZ MASTO. Thank you, Mr. Chairman. Thank you, everyone, for being here. This is a great conversation.

First of all, let me just say I recognize that the SEC is undergoing an investigation as well, and I look forward to the results of that investigation. And then as the Senator from the great State of Nevada, born and raised in Las Vegas, I am listening to all of the comparisons with the casinos particularly across this country, but knowing one thing, our casinos do not allow anybody that is under the age of 21 to gamble, and there is a reason. We want to protect our youth.

So let me ask you this, because I am concerned about the gamification of the market and what we are seeing with some of these apps. It is clearly looking to target a particular area, I think, of our youth who are now more engaged in gaming apps than we have ever seen before.

So let me ask Professor Fletcher, should the design features of trading apps because regulated?

Ms. FLETCHER. At a minimum—so thank you very much for that question, Senator. I think at a minimum they have to be studied, right? Because one of the things, as Professor Ghilarducci has noted, is that there are certain behavioral economics at play here. And so when we have things like confetti raining from the skies for having done a trade, this raises concerns about the types of encouragement that we are giving traders for just doing trades, which may be problematic as we think about trying to encourage appropriate behavior within the capital markets.

Senator CORTEZ MASTO. Thank you. So let me also ask this then: Particularly for young adults, do retail broker-dealers provide enough education and disclosure to individual consumers or should there be more?

Ms. FLETCHER. Currently it does not seem I would be able to say—it does not seem as though these broker-dealers provide that type of education to retail investors. I know that this is a focus of Professor Ghilarducci's research, and so currently I do not believe that they provide this level of education for retail investors, which then allows them to profit right off retail investors engaging in risky behavior that is not wealth-maximizing for these investors.

Senator CORTEZ MASTO. So let me ask then, Ms. Robasciotti, do you think that anybody under the age of 21 should be allowed to engage in the stock market, particularly what we have seen with Robinhood, a young man who was only 20 years of age committing suicide because he felt he overextended himself?

Ms. ROBASCIOTTI. Thank you very much for the question, and it was very sad what happened with that particular young man. I do believe that, given that we have all transferred responsibility for our retirement from these defined benefit plans and pensions down to us all being responsible for ourselves, we need to get as early a start as possible. So, yes, I would recommend that people under 21 be able to invest, yet it is incumbent upon as a society in that transfer of responsibility for our long-term financial security, we need to also transfer the education. Right now it is just happening within families, mostly from father to son and wealthy families, and I believe that is a big underpinning reason for why there is such concentration of wealth where it is in the country.

Senator CORTEZ MASTO. Do you think that the payment for order flow models should be banned?

Ms. ROBASCIOTTI. I do, absolutely. I do, absolutely, and specifically because I tell my clients this constantly, that if you do not see what you are paying, you are probably paying more than you would be comfortable with. And payment for order flow is doing exactly that. The customer never sees it, and yet they are paying for it in terms of the price that they ultimately get.

One of the reasons that our markets are orderly, fair, efficient, one of the ways that they remain so is by ensuring that as much information and data is disclosed as possible, and that just seems like a huge gap.

Senator CORTEZ MASTO. Does anybody on this panel believe that it should not be banned?

Mr. PIWOWAR. If I may, I do not think it should be banned without proper study. As I mentioned in my testimony, if you ban payment for order flow, you are highly likely to go back to commission-based trading, and it just shifts the conflict of interest from best execution requirements to churning accounts, and then that is the best interest requirement in terms of customers. So we have to be careful in these things. It is best left for the SEC to study the issue. I agree with Professor Fletcher on that. The SEC absolutely should study it in a zero commission environment, you know, look at all the costs and benefits, and then make a decision based on that.

Senator CORTEZ MASTO. OK. Thank you.

And, Mr. Vollmer, you raised your hand, so you believe the same thing. Is that correct?

Mr. VOLLMER. I start with Mr. Piwowar and Professor Fletcher—we need to look carefully, we need to proceed cautiously here. Start from the proposition that every participant that provides services in the market deserves some reasonable, fair compensation—the broker-dealers, the wholesale broker-dealers who also act as internalizers, like Citadel Securities, and the exchanges. They all provide important services to our capital markets. They all deserve compensation.

Payment for order flow is a method of compensation. If you remove it, you need to find another mechanism. That is why Mr. Piwowar says you are going to reinstitute commissions on trades. So everything is interrelated here. All of these relationships are connected. So I think we need to proceed cautiously, and I strongly agree with let us look and gather evidence and data. But I do not like the payment for order flow because it is disruptive and it is not obvious to investors.

Senator CORTEZ MASTO. Thank you. Thank you all.

Chairman BROWN. Thank you, Senator Cortez Masto.

Senator Ossoff from Georgia is recognized. His camera is not on, and he can proceed with or without it. Senator Ossoff, are you there?

Senator OSSOFF. Thank you, Mr. Chairman. I appreciate that. On Saturday, with overwhelming bipartisan support, the Senate passed the American Rescue Plan, and unlike traditional monetary expansion which subsidizes investment banks and unlike other recent fiscal measures that have subsidized corporations and wealthy donors, zero percent of the stimulus checks and tax credits in this bill goes to the top 1 percent. And I would like to point out for colleagues on this panel who oppose the bill that, following Senate passage, the OECD has revised its growth forecast for the U.S. economy, doubling it from 3.2 percent to over 6 percent this year. And the OECD projects that this legislation will boost global growth by a full percentage point this year.

Ms. Robasciotti, the title of this hearing is "Who Wins on Wall Street?" We just passed an ambitious fiscal measure in the Senate. Given that the bottom 50 percent of American households by wealth possess just 1 percent of total national wealth held in the stock market, what, in your view, are the benefits of economic policy that gets cash directly to low-wealth households by fiscal measures versus economic policy that adds liquidity to financial markets via the banking sector like traditional monetary policy?

Ms. ROBASCIOTTI. Thank you very much for the question, Senator Ossoff. The way that it actually occurs, when you give money to people who come from the kind of background that I have, they are more likely to spend it. We learned about this, you know, in economics textbooks as the marginal propensity to consume. But it is just true that if you give money to those who are more in need, they are going to be more likely to spend it and circulate it throughout the economy, and so it does not just help them. It is not just something that we want to do to help the vulnerable. It is actually something that creates a multiplier effect throughout the entire economy. So I believe it just makes good economic sense.

Senator OSSOFF. Thank you. And what, in your view, are the costs, Ms. Robasciotti, of economic stimulus like traditional monetary expansion, which adds liquidity to financial markets by allowing investment banks to access credit at extraordinarily low rates or just transfers cash to financial institutions' balance sheets by processes like quantitative easing?

Ms. ROBASCIOTTI. Again, thank you for the question. Those who are doing well at this point with their outsize gains, particularly during the pandemic, do not need any more help. What it actually does is just sequesters that money in the hands of those who are

most wealthy and are not going to put it back necessarily into the economy. You know, we had that argument of trickle-down economics, and we can kind of see from where we all are that that is not actually what happened. And so it actually harms all of us to make sure that those types of economic stimulus are going to the wealthiest in the country rather than going where it is going to actually do us all some good.

Senator OSSOFF. Thank you, Ms. Robasciotti. Professor Fletcher, you opened your testimony by rightly noting, "A core purpose of the financial markets is to facilitate the efficient allocation of capital." I am curious for your perspective on this. Over the last 15 years, U.S. investment banks have required multi-trillion-dollar bailouts to avoid insolvency, and even after the acute credit crisis in 2007–08, central banks and the Federal Reserve have continued to grant investment banks access to credit at record low rates and engaged in sustained quantitative easing, adding trillions of dollars to financial markets. Do you believe, Professor Fletcher, that the U.S. financial system in its current configuration facilitates the efficient allocation of capital?

Ms. FLETCHER. Thank you so much for that question, Senator. I think that the U.S. capital markets are among some of the best capital markets in the world, but there are significant issues with the market structure that we have currently in that we have retail investors that are better able to make risky decisions without fully appreciating the cost of those decisions. Within our capital structure, we also have questionable valuations for some companies that may not be fully reflective of an efficient market. So do I believe that our markets are fully efficient, no, not quite; but do I believe that they are among the most efficient in the world, absolutely.

Senator OSSOFF. Thank you, Professor. Thank you, Mr. Chairman. I yield back.

Chairman BROWN. Thank you, Senator Ossoff.

Thank you to the witnesses for being here today, for your really incisive testimony. Thank you for that.

I will just make a brief announcement. For Senators who wish to submit questions for the record, these questions are due 1 week from today, Tuesday, March 16th. For witnesses, you have 45 days, if you would, to respond to any of those questions from me or from my colleagues. Thank you again for that.

A couple of comments. I appreciated Professor Ghilarducci making it clear that the stock market is not the economy. Making the markets fair is important, but equally important is remembering that half the country does not have any stocks at all. Most Americans get their money from a paycheck. Growing those paychecks, not growing stock prices, is the most important thing we can actually do to improve American families' lives. And when people's hard work pays off, the more they are able to put a little aside at the end of the month and invest for the future. We are never going to have fair markets or an economy that reaches its full potential until our economy and its rules reflect the dignity of work.

With that, the hearing is adjourned. Thank you all so much.

[Whereupon, at 11:55 a.m., the hearing was adjourned.]

[Prepared statements, responses to written questions, and additional material supplied for the record follow:]

PREPARED STATEMENT OF CHAIRMAN SHERROD BROWN

Last February, as the world came to the collective realization that we were confronting a global pandemic, the U.S. stock market suffered its fastest drop in history, plummeting 34 percent in 33 days.

That was followed by the fastest stock market rebound in history, recovering all of those losses by mid-August.

It was clear what most working people had suspected for a long time: that the stock market is detached from the economy and the reality of most Americans' lives.

The coronavirus was spreading, widespread testing wasn't available, and we didn't know if the hope of a vaccine was months or years away.

Unemployment soared, reaching 23 million jobs lost by April. Almost one year later, only about half of those jobs have been recovered. Families and small businesses had no certainty about what their lives would look like in a few weeks, let alone next year.

But the stock market continued to go up and up, and those lucky enough to own investments reaped the profit.

To some, this looked like a new development. But to millions of workers who have watched the stock market reach new heights while their own paychecks never kept up, it looked pretty familiar.

Families haven't been too surprised by this state of affairs—a whole lot of them never recovered from a foreclosure or losing their savings during the last crisis, but watched Wall Street pocket its bailout and go on to record highs a few short years later..

That's because when you look at who truly benefits, it's clear that the stock market's gains funnel wealth to a tiny sliver of people, often at the direct expense of American workers. We discussed this last week in our hearing Wall Street vs. Workers.

According to Federal Reserve data, the wealthiest one percent hold 53 percent of stock and mutual fund investments, and the bottom 90 percent own less than 12 percent.

Between workplace retirement accounts and personal investments, about half of American households have at least one financial account tied to the market, but only one in six directly own stocks.

And none of this reflects the actual makeup of the country. Only 31 percent of Black families and 28 percent of Hispanic families own any stock investment.

The wealthy are far more likely to have these accounts than middle-class families, who in turn are far more likely to be in the market than working-class or poor families.

So when the stock market soars, most people barely notice. They're just trying to keep up with the cost of living within their paychecks.

In recent years, the growth of fintech in financial services has given rise to trading platforms that offer free stock trades. Firms like Robinhood and others claimed to "democratize" stock trading with flashy marketing and easy-to-use features.

And in one sense, it worked—they attracted millions of customers, many of them young and new to investing.

The frenzied stock trading this January, when shares of GameStop Corporation went from $18 to over $400 in a matter of weeks, showed how millions of retail investors could engage with each other and create a sensation.

But it also lays bare serious risks.

There are real people who got caught up in the frenzy who suffered real consequences. If the people who are busy working, watching their kids, or living their lives can't make sense of the stock market's booms and busts, they'll continue to lose faith in the market. And hedge funds and insiders will continue to reap the vast majority of the profit.

That's bad for everyone in the long run.

Robinhood tried to blame its decision to cut off its customers from being able to purchase GameStop and other stocks on industry-wide standards for processing stock purchases. Of course, the SEC and others should examine and consider how to reduce risk in the financial system by cutting the time it takes to complete stock purchases. Everyone would benefit.

But it's become clear that firms like Robinhood were founded on a model that exploits small investors by encouraging fast and loose trading, and then sells their trades to big market players.

In a few short years, Robinhood violated the law, failed to respond to customers when they needed help, and when it got in trouble, cut off customers to save itself. Robinhood attracted new customers to investing, encouraged them to trade, profited

off of them, and then broke their trust—precisely when they needed the company to have their backs.

It is also obvious that the David versus Goliath story we first heard in January was not the whole picture. Well-funded, sophisticated hedge funds made big profits alongside the people trading at home, and we know they always had better access and information than any of us ever will. No one thinks that's fair.

Some have tried to blame the small-time investors. They scold people just trying to make some extra money in the worst job market we've seen in most of our lifetimes.

Because of the Robinhood business model, we've all learned the new term "gamification".

But let's be clear: We've seen Wall Street treat the markets as a game for decades—a game they always win, at the expense of pretty much everyone else.

Wall Street has never been friendly to the little guy. Surely this time is no different.

Yes, some regular people have had success. But fundamentally, the system is set up to funnel more wealth to the already-wealthy. Just like in Las Vegas, the House always wins.

The economy and the markets should work for everyone, not just the well-connected. And they should reflect the economy we all want—with broadly shared prosperity, and a growing middle class that all workers can join.

When that happens, people will have confidence the markets will actually work for them, not just Wall Street. And we'll see more Americans save and invest for the future.

This hearing will examine not only the volatile activity in a dozen stocks early this year, but also the practices that encouraged that activity. We will see how it affects our economy in the long term, and who benefits and who loses from this "tech induced" stock market volatility.

I look forward to our witnesses' testimony.

PREPARED STATEMENT OF GINA-GAIL S. FLETCHER

PROFESSOR OF LAW, DUKE UNIVERSITY SCHOOL OF LAW

MARCH 9, 2021

Chairman Brown, Ranking Member Toomey, Members of the Committee: Thank you for inviting me to testify at this hearing. I am a Professor of Law at Duke University, where my research focuses on financial regulation, market manipulation, and corporate law. Before becoming an academic, I practiced law at Gibson, Dunn, & Crutcher LLP, in the areas of securities regulation, banking, and mergers and acquisitions.

Introduction

A core purpose of the financial markets is to facilitate the efficient allocation of capital. [1] When functioning efficiently, the markets allow for capital to be put to its most profitable use, which enables firms to access capital and improves the allocation of finite resources within the markets and the economy. When the fundamental operation of the markets is undermined, there are far-reaching effects that extend beyond the capital markets, affecting consumer savings, investments, retirement plans, and the rest of the real economy. [2]

The recent market volatility stemming from trading in "meme stocks", most notably GameStop, [3] has raised concerns as to the integrity, stability, and overall health of the markets. Over the course of a few weeks in early 2021, GameStop—a struggling retailer of video games—saw its share price increase 1,500 percent, crash, and then spike again. [4] In the wake of the volatility of GameStop's stock price, many in-

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[1] Gina-Gail S. Fletcher, "Legitimate Yet Manipulative: The Conundrum of Open-Market Manipulation", 68 *Duke L.J.* 479, 489 (2018).

[2] Id.; see Benjamin P. Edwards, "Conflicts & Capital Allocation", 78 *Ohio St. L.J.* 181, 184-85 (2017).

[3] John Hyatt, "How GameStop (GME) Is Creating Volatility—and Opportunities—for Investors", NASDAQ (Jan. 29, 2021, 1:54 PM), *https://www.nasdaq.com/articles/how-gamestop-gme-is-creating-volatility-and-opportunities-for-investors-2021-01-29*.

[4] Reuters Staff, "Timeline: The GameStop Battle—How It Unfolded for the Key Players Testifying", Reuters (Feb. 18, 2021, 1:20 AM), *https://www.reuters.com/article/us-retail-trading-gamestop-timeline/timeline-the-gamestop-battle-how-it-unfolded-for-the-key-players-testifying-idUSKBN2AI0IQ*.

vestors (both large and small) have been left with significant losses [5] and some market participants and members of the public wonder whether the GameStop volatility is the "new normal" for the markets.

The recent market events have raised questions as to the long-term health of the markets, specifically the effects of such extreme volatility and the conduct that drove it on public perception of the markets. Additionally, these market developments have brought to the fore some issues related to how the markets function and are regulated, such as efforts to promote market integrity and prevent market manipulation; the costs and impacts of conflicted brokers' routing practices, including payment for order flow (PFOF); and the impact of larger numbers of small-dollar, higher risk trading in the markets. [6]

I. Market Integrity and Stability

A. Market Integrity: The Importance of Public Perception

Market integrity is key to the functioning of healthy capital markets. [7] Market integrity is a broad term that refers to notions of market fairness, investor protection, and the absence of misinformation and market abuse. To the extent the public believes the markets are fair, investors are likely to participate in the markets. Conversely, if the markets are viewed as unfair, investors may refrain from participating in the markets altogether or, should they participate, discount all transactions to reflect the risk of dealing in an unfair market. [8] Public perception of the fairness (or unfairness) of the market, underlies market integrity and, in turn, is crucial to the efficient allocation of capital.

The GameStop incident has highlighted public perception of the unfairness of the markets, on the one hand, and raised new concerns about the integrity of stock prices. As trading in GameStop gained momentum, a narrative of David vs. Goliath coalesced, with the individual, Reddit-led investors being cast as David against the short selling, hedge fund Goliaths. [9] Many of these individual investors expressed the viewpoint that the markets were "rigged against the little guy" and saw their GameStop trades as a way to right the wrongs of the past.

While the realities of who was trading in which directions, how much, and when will take time to decipher, the views echoed in the GameStop incident are reflective of a larger narrative about the integrity and fairness of the markets. In recent years, an increasing view is that the markets are regulated for the benefit of Wall Street and to the detriment of Main Street. [10] During the 2008 crisis, for example, banks received bailouts while ordinary citizens lost their jobs and homes, struggling to recover years later. Likewise, with the COVID–19 pandemic millions of Americans lost their jobs and their health, but public corporations earned unprecedented profits and the stock market continued to soar. The disparate impact of these two significant financial crises on ordinary citizens versus the economic elite, especially when coupled with the (seeming) lack of enforcement against corporate wrongdoing, have fomented the strong perception that the markets are titled in favor of the wealthy, the banks, and the hedge funds.

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[5] Harry Robertson, "Short-Sellers Are Nursing Estimated Losses of $19 Billion in 2021 After Betting on GameStop's Stock To Plunge", *Markets Insider* (Jan. 30, 2021, 2:31 PM); Drew Harwell, "As GameStop Stock Crumbles, Newbie Traders Reckon With Heavy Losses", *Washington Post* (Feb. 2, 2021, 5:34 PM), *https://www.washingtonpost.com/technology/2021/02/02/gamestop-stock-plunge-losers*.

[6] See, e.g., William Watts, "GameStop Saga Illustrates Rising 'Noise-Trader Risk' That Could Feed Market Volatility, Warns Quantitative Analyst", *Marketwatch*, (Feb. 26, 2021, 1:55 PM), *https://www.marketwatch.com/story/gamestop-saga-illustrates-rising-noise-trader-risk-that-could-feed-market-volatility-warns-quantitative-analyst-11614365724*.

[7] Fletcher, supra note 1, at 493.

[8] Id. at 492-93.

[9] See, e.g., Associated Press, "GameStop Soars as Swarming Small Investors Face Down Hedge Funds", *L.A. Times* (Jan. 25, 2021, 1:39 PM), *https://www.latimes.com/world-nation/story/2021-01-25/smaller-investors-face-down-hedge-funds-as-gamestop-soars*; Edward Helmore, "How GameStop Found Itself at the Center of a Groundbreaking Battle Between Wall Street and Small Investors", *Guardian* (Jan. 27, 2021, 5:00), *https://www.theguardian.com/business/2021/jan/27/gamestop-stock-market-retail-wall-street*; "All Things Considered: Reddit Users Vs. Wall Street Giant in Fight Over GameStop Stock Value", NPR (Jan. 27, 2021, 4:14 PM), *https://www.npr.org/2021/01/27/961279048/reddit-users-vs-wall-street-giant-in-fight-over-gamestop-stock-value*.

[10] See, e.g., Alexis Goldstein, "Opinion, The Trouble With GameStop Is That the House Still Wins", *N.Y. Times* (Feb. 1, 2021), *https://www.nytimes.com/2021/02/01/opinion/gamestop-biden-wall-street-reddit.html*; Zachary Karabell, "How the GameStop Trading Surge Will Transform Wall Street", *Time* (Jan. 28, 2021, 8:44 PM), *https://time.com/5934285/gamestop-trading-wall-street.*

The proliferation of these views indicates that many investors do not view the markets as honest, fair, or accessible. Increasingly, seemingly freed by this recognition of the apparent "unfairness," many investors appear to be engaging in transactions that undermine capital allocation and distort asset prices to (attempt to) tilt the markets in their favor.

Yet, even for those who did not previously believe the markets are inherently rigged to favor insiders, the extreme volatility associated with meme stocks may nonetheless cause them to be concerned with the integrity and stability of the markets. This is particularly true if regulators and lawmakers fail to act-either by not addressing the underlying cause for the volatility or by not holding someone accountable for wrongdoing.

To safeguard the integrity of the markets, therefore, it is important that lawmakers and regulators undertake efforts to repair the market's reputation and bolster investor confidence. Research has shown that when investors question the integrity of the markets, they withdraw from the markets, reducing the amount of capital available in the market in general. [11]

Thus, failure to address the issues that GameStop trading highlights may, ultimately, weaken the markets.

While addressing these issues is neither simple nor straightforward, this ought not dissuade Congress and the SEC from investigating how to minimize the likelihood and impact of a future iteration of the volatility we witnessed earlier this year.

B. Market Manipulation: Was GameStop Stock Manipulated?

A common theme accompanying discussions about GameStop's stock price was market manipulation. Many questioned whether the coordinated trading of Reddit-inspired investors constituted market manipulation from a legal standpoint and what if anything the SEC should or could do in response.

Among the initial motivators behind the adoption of the securities laws was the prevention of market manipulation. Although the purpose of financial market regulations and laws has since been extended, proscribing and punishing market manipulation remains one of primary goals of the SEC. Market manipulation imposes significant social and financial costs on the financial markets. Furthermore, it undermines the efficient allocation of capital by distorting prices and by contributing to the perception that the markets lack integrity.

Despite its centrality to securities laws, market manipulation is undefined in the securities laws. [12] Instead, the laws and associated regulations prohibit specific, named conduct such as price artificiality, fictitious trades, and fraud. Some have commented that the absence of a statutory definition is the reason that this area of the law is confusing and contradictory. But, as others have noted, given the unexpected ways in which the markets may develop, tying regulators to a fixed definition of manipulation may do more harm than good. [13]

In identifying manipulative conduct, courts have typically looked for evidence of willful misconduct, fraud, and/or an artificial price. Academics have also tried to define manipulation through conduct that has an improper effect on price or efforts to dominate supply and demand to artificially distort prices.

Notwithstanding the lack of an agreed upon definition, the SEC, FINRA, and the exchanges all have anti-manipulation provisions that proscribe and punish abusive practices that distort asset prices. But as decades of enforcement actions and litigation has demonstrated, proving market manipulation as a matter of law can be very difficult. Indeed, one person's manipulation can be seen as another person's exuberance, even if irrational.

Whether the GameStop incident rises to the level of legally recognized and punishable market manipulation is a fact-intensive inquiry, which is ongoing. But, beyond the stark question of whether this constitutes illegal manipulation, the GameStop incident highlights the ways in which social media and technology have combined to push the limits of market regulations. It also calls into question to what extent existing understandings of manipulation can adequately respond to and, ultimately, deter the type of misconduct that may have occurred. Regardless of the outcome of the pending investigations into possible market manipulation, there are two recommended actions Congress and the SEC should consider.

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[11] Emilios Avgouleas, "The Mechanics and Regulation of Market Abuse" *A Legal And Economic Analysis* 212 (2005).

[12] Fletcher, supra note 1.

[13] As one court opined: "Congress' decision to prohibit manipulation without defining it apparently arose from the concern that clever manipulators would be able to evade any legislated list of proscribed actions or elements of such a claim." In re "Soybean Futures Litig.", 892 F. Supp. 1025, 1044 (N.D. Ill. 2015).

First, Congress and regulators should hold traders accountable for their words and actions, even in the absence of explicit fraud. Price distortion can occur without explicit fraud and, when it does, someone ought to be held accountable.[14] There ought to be consequences for using internet platforms and social media to encourage others to buy/sell stock, if result is a price that is so distorted as to be completely divorced from the company's fundamentals.

Unfortunately, manipulation laws have become ossified, and courts have been somewhat hostile to new interpretations and applications of the law from regulators. This makes it somewhat challenging for regulators to address novel forms of market manipulation using laws that were written almost a century ago and long before most of the things that are commonplace in today's markets were even conceivable. The type of coordinated action among thousands of dispersed, small-dollar investors that was seen during GameStop's rise was not imaginable when courts and regulators first conceptualized the market power needed to squeeze or corner the markets. However, in today's markets this is not only plausible, but it can be just as disastrous as traditional manipulation schemes.

As the markets evolve and the types of abusive trading tactics evolve along with it, it becomes increasingly urgent that Congress revisit and expand the antimanipulation authority granted to the SEC. Congress and regulators should explore updating the laws and rules against market manipulation to ensure regulators have the tools they need to protect the integrity of the markets against intentional, extreme price distortions.

Second, the SEC has traditionally relied on enforcement actions to address market manipulation. Punishing traders ex post for their conduct has been an understandable approach in the past, but it is not as sound in the modern markets where herd behavior is swift and can be disastrous. In today's markets, the SEC should explore the types of ex ante guardrails needed to protect the markets from extreme price distortion that will undoubtedly leave destruction in its wake.

As the volatility in GameStop and other stock persisted, the SEC issued a statement that it was monitoring the situation, but failed to take any action. The agency's refusal to act lead many to wonder why trading in GameStop stock was not halted once it became clear that the stock price was completely and unjustifiably divorced from the company's fundamentals. Arguably, the SEC's failure to act created a vacuum of authority, which resulted in a haphazard and uneven response from market actors. While some brokers halted trading in GameStop, others did not, causing public uproar. Leadership from the SEC indicating what should have been done or, at a minimum, a statement of recommended action would have had a better outcome for the markets and less public furor.

It is not beyond the scope of the SEC's authority to proactively consider how it will respond to certain indicators of price distortion and manipulation in the markets. In light of the far-reaching consequences of manipulation on today's interconnected markets, it is imperative that the SEC consider how to address extreme volatility in real time, particularly when such volatility may be borne from manipulative and abusive trades.

II. Democratizing the Capital Markets

A. The Impact of Technology and Innovation on Retail Investors' Access to the Public Capital Markets

The Federal securities laws were adopted to ensure that all investors—not just sophisticated, wealthy, or connected insiders—have access to essential information about companies and basic shareholder rights. In many ways, the Federal securities laws exist to "democratize" the capital markets.

In recent years, financial innovation has further expanded the availability of capital for firms and enhanced retail investors' access to the markets.[15] The creation and proliferation of discount brokers, mutual funds, exchange traded funds, and 401(k) plans have made investing available to a large segment of the population. Further, the entrance of robo-advisors onto the financial scene has granted investors access to model portfolios tailored to their risk profiles and investment preferences, further increasing access for consumers seeking low-cost financial advice.[16]

[14] Fletcher, supra note 1.

[15] John V. Duca, Fed. Reserve Bank of Dallas, "The Democratization of America's Capital Markets" 10-13 (2001).

[16] Anne Tergesen, "Robo Advisers Seen Exploding in Popularity", *Wall St. J.* (Dec. 11, 2015, 7:08 PM), *https://www.wsj.com/articles/robo-advisers-seen-exploding-in-popularity-1449860367.*

The democratization of the financial markets, therefore, has been ongoing for decades, but it has undoubtedly exploded in measure and kind in the past 5 years.[17] Efforts to increase retail access to the markets have resulted in greater participation in index funds, mutual funds, etc., which rely on intermediaries to transact on consumers' behalf.[18] Recently, with the rise of zero-commission trading, retail investors are choosing to directly participate in the markets at unprecedented levels.

In the past year or two, many low-cost brokers have eliminated explicit fees to buy and sell stocks, thereby opening up access to the markets to those who may have been unwilling or unable to trade because of what were once significant explicit commissions and fees.[19] Additionally, the ability to trade in fractional shares has lowered costs for investors who no longer need over $2,000 to buy a single share of a company like Amazon, for example; instead, they can purchase $100 of stock or 1/20th of the share. With technology, market democratization has gone a step further—brokers allow trading through apps, thereby making it easier for younger investors to access the markets on their mobile devices.[20] Today, it is not a stretch to say that the markets are truly within reach of anyone.

These developments have had a noteworthy and positive impact on retail participation in the markets. A recent study has demonstrated that the racial gap in individual stock ownership has been halved in less five years.[21] Similarly, a recent FINRA study found that the majority of investors who opened their first account in 2020 were under the age of 45, had lower incomes, and were more likely to be racially and ethnically diverse.[22]

In sum, technology and innovation have enabled a "shift towards more equitable investment participation," which is a laudable achievement in the development of the markets.[23]

However, the rules for stock trading have generally not kept pace with these rapid evolutions. Technology has made it easy to trade incredibly complex, leveraged, and high-risk investments, with relative ease. I urge Congress and the SEC to think clearly about what that means not just for those investors, but for the millions who invest through pension funds and mutual funds, as well as the businesses and economy that rely on our capital markets.

If you wish to further democratize the capital markets, I would urge you to begin by restoring the emphasis on the public markets, and looking to reverse the proliferation of exemptions and exceptions from the Federal securities laws.

B. The Private Capital Markets Are Not Suitable for Retail Investors

Because of the great strides retail investors have made in accessing the public capital markets, there may be an inclination to consider granting them access to the private capital markets. The recent market events have exposed the growing discontent of retail investors with the perceived unfairness of the public markets. As the argument goes, institutional investors and high-net-worth investors have access to a market that is brimming with greater returns on investment that the public markets and it is to the disadvantage and detriment of the retail investor to deny her access to these markets. This argument, however, ignores key factors that would put retail investors in a significantly worse position if they were able to invest directly in private securities.

The public capital markets in the U.S. are based on a system of regulation that is based fundamentally on mandatory and ongoing disclosure from those offering securities to investors and the public. Broadly, securities must be registered with the

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[17] See Charlotte Gifford, "Democratising Finance", *World Fin.* (Jan. 25, 2021), *https://www.worldfinance.com/special-reports/take-from-the-rich-give-to-the-poor.*

[18] Jay Clayton, Chairman, SEC, Speech at Temple University: "The Evolving Market for Retail Investment Services and Forward-Looking Regulation—Adding Clarity and Investor Protection While Ensuring Access and Choice" (May 2, 2018), *https://www.sec.gov/news/speech/speech-clayton-2018-05-02.*

[19] For example, Schwab eliminated fees for stock purchases in October 2019. See Alexander Osipovich and Lisa Beilfuss, "Schwab Cuts Fees on Online Stock Trades to Zero, Rattling Rivals", *Wall St. J.* (Oct. 1, 2019, 7:04 PM).

[20] Alicia Adamczyk, "Trading Apps Like Robinhood Are Having a Moment. But Users Should Be Careful", CNBC (Aug. 24, 2020, 3:49 PM), *https://www.cnbc.com/2020/08/21/robinhood-is-having-a-moment-users-should-be-careful.html*.

[21] Aaron Brown, "Opinion, Stock Investors Are Younger and More Racially Diverse", *Bloomberg* (Sept. 21, 2020, 6:00 AM), *https://www.bloomberg.com/opinion/articles/2020-09-21/stock-investors-are-younger-and-more-racially-diverse*.

[22] News Release, Angelita Williams and Eric Young, "FINRA, New Research: Global Pandemic Brings Surge of New and Experienced Retail Investors Into the Stock Market" (Feb. 2, 2021), *https://www.finra.org/media-center/newsreleases/2021/new-research-global-pandemic-brings-surge-new-and-experienced-retail.*

[23] Id.

SEC prior to being offered and sold on the public markets.[24] There must be "full disclosure of the character of such securities,"[25] including basic information about the company, its management, and its financials. Further, after a company is "public," it must share information with the public fairly, and cannot selectively disclose information to favored investors or other insiders.

The mandatory disclosure regulatory regime of the U.S. public markets is foundational to market democratization because it ensures that all investors—regardless of size, influence, insider connections, or wealth-have access to the same information on an ongoing basis. Mandatory disclosure obligations for accessing the capital markets levels the playing field as between retail investors with no access and corporate insiders or sophistication, influential investors.

To grant retail investors access to the private capital markets would place retail investors at a significant informational and positional disadvantage because there would be considerable information asymmetry. As a starting principle, it is important to keep in mind that "private" markets refer to markets for which the mandatory comprehensive disclosure and rights regime of the Federal securities laws do not apply.[26]

In contrast to the public markets where information is readily available, the private markets are opaque and subject to little to no disclosure requirements.[27] This lack of disclosure means that investors in the private markets must ascertain the value of securities on their own and without the help of the public disclosures or readily available information. Indeed, private securities typically have no generally agreed upon "market price" as the company's valuation is often determined separately with each new round of financing. Trading prices in private market trading venues often have massive variations, and comparatively high transaction costs.[28]

Unsurprisingly, private company valuation is notoriously fraught with complications and disagreement, resulting in valuations that may be unsupported based on the company's undisclosed financial condition. The case of WeWork provides a salient example. In January 2019, the company was valued on the private markets at $47 billion. It's largest shareholder SoftBank is an investment bank with significant experience investing in private companies. Yet, shortly after WeWork filed its S-1 to initiate a public offering of its stock, the company's valuation plummeted. Several months later, after a shelved IPO, WeWork was valued at a little under $3 billion.[29] But again, this valuation was based on SoftBank's calculations, which are debatable given that WeWork is still private and not subject to public disclosure of its financial condition.

The alarming failure of SoftBank, an undeniably sophisticated investor in the private markets, to value WeWork should raise serious doubts as to whether a retail investor, even a sophisticated one, would fare any better in valuing a private company.

Additionally, the absence of standardized and mandated information dissemination means that retail investors will be at a severe disadvantage relative to insiders and more powerful investors who can demand information or negotiate disclosures from private issuers. With no regulatory mechanism to force disclosures, there is no reason to believe that private companies will voluntarily and on a timely basis disclose information, even information material to the value or future existence of the company, such as the loss of a major client, the imposition of government sanctions, or pending bankruptcy.

Likewise, whereas in the public markets Regulation Fair Disclosure prohibits selective disclosure of information, there is no corollary in the private markets. Private companies can provide information to institutional investors in compliance with contract-based information rights but refuse to provide the same information to retail investors. Retail investors, therefore, would be completely in the dark as to the operation, profitability, future, and value of private companies if allowed to invest

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[24] Securities Act of 1933 §5, 15 U.S.C. §77e (2018).

[25] H. Rep. 73-85 (1933), at 2-3.

[26] See, e.g., Press Release, SEC, "SEC Charges AT&T and Three Executives with Selectively Providing Information to Wall Street Analysts" (Mar. 5, 2021), *https://www.sec.gov/news/press-release/2021-43#.YEOQlWUhHjk.twitter.*

[27] Elizabeth Pollman, "Information Issues on Wall Street 2.0", 161 *U. PA. L. Rev.* 179, 235-36 (2012).

[28] Letter from Tyler Gellasch, "Health Markets Ass'n. to Off. Sec'y", SEC, (Sept. 30, 2019), *https://healthymarkets.wpengine.com/wp-content/uploads/2019/09/SEC-Concept-Release-9-30-19-1.pdf.*

[29] Bryan Pietsch, "WeWork's Valuation Has Fallen From $47 Billion Last Year to $2.9 Billion", *Bus. Insider* (May 18, 2020, 11:38 AM) *https://www.businessinsider.com/wework-valuation-falls-47-billion-to-less-than-3-billion-2020-5#::text=WeWork's%20valuation%20has%20fallen%20to,said%20in%20its%20earnings%20report.*

in them. At a such a disadvantaged position, it would be impossible for retail investors to make an informed decision as to how to allocate their capital in the private markets.

C. Policy and Practical Considerations/Implications Regarding Greater Retail Participation

While the public markets are more suitable for retail investors versus the private markets, there are concerns that arise with regards to greater retail participation in the public markets. To be clear, these concerns do not equate with eliminating retail participation in the markets, but they do signal the need to consider how to address the ramifications on not only those investors, but also the overall operation and structure of the market. There are three issues I would like to raise.

First, retail investors seem to have very limited understanding of the markets and products that they are trading. As a 2020 FINRA study notes, there were "low levels of investment knowledge among all types of investors [in the study]-new and experienced . . . ." [30] The lack of knowledge among retail investors indicates that there is likely an underappreciation of the risks and costs of participating in the markets. Specifically, approximately 38 percent of new investors self-assessed their investment knowledge as low/very low. [31]

And, on the objective investment knowledge assessment, all investor types scored poorly. [32]

Indeed, it is particularly noteworthy given that the investors are participating in the public capital markets, where there is an abundance of information on the corporations in which they may trade. Yet, their understanding of the markets and their transactions were concerningly low. As the FINRA study concludes, the low level of knowledge among investors, particularly new investors, makes them "potentially unprepared to make sound investment decisions . . . ." [33] Thus, while increased retail participation is laudable, it is imperative to consider how to protect retail investors from unsuitable investments that they neither understand nor appreciate the risks.

Second, with the proliferation of zero-commission brokers and trading apps that ease access to the markets, there is the question: what are retail traders able to access with these modern-day brokers? A troubling aspect of the GameStop incident is that many traders were trading call options on the stock. [34] The widespread use of options in GameStop trades reflects the ease with which retail investors are now able to trade complex financial products on margin, which is concerning for a few reasons.

Options trading is complex and can entail significant risks for traders. Options are leveraged transactions that can amplify the gains and losses a trader experiences in the market. There are real policy issues at play when we consider whether retail investors ought to be able to trade on leverage-either at all or as easily as they currently can through some retail broker-dealers. Given than a large number of investors in a recent FINRA study stated that they were unaware of whether their account charged fees, [35] how can we expect retail investors to appreciate the risks attendant with options trading and other complex financial instruments. [36]

Investor understanding of the risks, costs, and potential fallout from options and leveraged trading is likely limited and, therefore, we should be more thoughtful about what financial products are available to retail investors. To be plain: democratization of finance cannot mean that investors, regardless of their experience and sophistication get access to options trading and margin accounts. This is not only foolish, but dangerous. Indeed, we need not look any further than the young man who committed suicide because he erroneously believed he had a negative balance

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[30] Id.

[31] FINRA Inv. Ed. Found., "Consumer Insights: Money & Investing, Investing 2020: New Accounts and the People Who Opened Them" 15-16, *https://www.finrafoundation.org/sites/finrafoundation/files/investing-2020-new-accounts-and-the-people-who-opened-them-1-0.pdf.*

[32] Id. at 16.

[33] Id.

[34] Chris McKhann, "GME Stock Options Trading Explained: The Leverage of Long Calls Against the Volatility of GameStop", *Inv's. Bus. Daily* (Feb. 1, 2021, 3:08 PM), *https://www.investors.com/research/options/gme-stock-options-buyers-got-rich-now-looking-puts.*

[35] Williams and Young, supra note 22.

[36] We have also seen retail investors not sufficiently appreciate leveraged ETFs, where retail investors often believe that their investment performance is simply going to be the returns of some index multiplied by some factor, but that is not how those products typically work. Div. Econ. & Risk Analysis, SEC, "Economics Note: The Distribution of Leveraged ETF Returns" (2019), *https://www.sec.gov/files/DERA-LETF-Economics-Note-Nov2019.pdf.*

of over $700,000.[37] There must be an awareness of the limited knowledge and expertise of retail investors as they gain access to increasingly complex products.

I would urge Congress, the SEC, and FINRA to reconsider the ready availability of complex financial products for retail investors. Further, Congress, the SEC, and FINRA should inquire into how investors are able to access margin accounts and options trading. Some reports have stated that users on certain broker platforms are defaulted into margin accounts, which raises significant concerns related to investor protection.[38]

Third, as retail traders become more active and potent participants in the market, it becomes necessary to consider how their presence and behaviors impact the broader markets. It may be tempting to think of the exuberance of retail investors for GameStop in January 2021 as a one-off event, but this would be short-sighted. Indeed, in June 2020 retail investors piled into Hertz stock, even though the company was going through bankruptcy, increasing the stock price tenfold.[39] Additionally, even as GameStop's price began its descent from its inexplicable highs, the stock price of other companies, such as AMC Theatres and BlackBerry, also began to increase because of retail investor interest.[40]

With significant reform, it is fair to believe that these wild swings in stock prices owing to retail traders may become a recurring feature of the markets. As was seen with GameStop, the fallout is not limited to traders, but there are consequences for the clearinghouse and for brokers as they try to keep pace with heavy transaction and order flow. There may also be significant consequences on the companies whose stock prices are gyrating. But perhaps even more concerningly, these wild fluctuations may prove to be a significant deterrent for future long-term investment.

Congress and the SEC should consider the extent to which the market and incentives structure that currently exists (such as payment for order flow, discussed below) contribute to the volatility accompanying increased retail interest in certain stocks.

Further, as these peaks and troughs become more common in the markets, I would encourage Congress and the SEC to explore whether the existing framework can manage the risks and consequences that accompany growing retail participation in the markets. To the extent it cannot, the answer ought not to lie with limiting retail participation, as seems to have happened recently when some broker-dealers suspended trading in highly volatile stocks. Rather, the onus should be placed on clearinghouses and brokers to do a better job of anticipating and responding to potential market volatility. To this end, I encourage Congress, the SEC, FINRA, and the DTCC to consider updates to broker capital requirements, margin call processes, and settlement processes.

III. Payment for Order Flow

A contributing factor to the recent market volatility that raises policy and regulatory concerns is payment for order flow (PFOF). PFOF is the practice by which brokers are compensated for routing client orders to third parties, such as wholesalers and market makers, for execution.[41] Through PFOF, retail brokers' commissions are subsidized or substituted by payments received from third parties who are able to profitably trade against those clients' orders.

During a Congressional hearing last month, Robinhood's CEO testified that over half of the firm's revenues came from PFOF.[42] With brokers, wholesalers, and mar-

[37] Maggie Fitzgerald, "Robinhood Sued by Family of 20-Year-Old Trader Who Killed Himself After Believing He Racked Up Huge Losses", CNBC (Feb. 8, 2021, 6:28 PM), *https://www.cnbc.com/2021/02/08/robinhood-sued-by-family-of-alex-kearns-20-year-old-trader-who-killed-himself-.html* (last updated Feb. 8, 2021, 9:26 PM).

[38] Letter from Tyler Gellasch, "Health Markets Ass'n, to Maxine Waters, Chairwoman, Comm. Fin. Servs.", Patrick McHenry, Ranking Member, Comm. Fin. Servs., Brad Sherman, Chairman, Subcomm. Inv. Prot. and Bill Huizenga, Ranking Member, Subcomm. Inv. Prot. 17 (Feb. 17, 2021), *https://healthymarkets.org/wp-content/uploads/2021/02/Letter-to-HFSC-Hearing-2-17-21.pdf.*

[39] David Welch and Steven Church, "What It Means To Buy Stock in a Bankrupt Company Like Hertz", Bloomberg (June 18, 2020, 5:00 AM), *https://www.bloomberg.com/news/articles/2020-06-18/what-it-means-to-buy-stock-in-a-bankrupt-company-like-hertz.*

[40] Gunjan Banerji, Juliet Chung, and Caitlin McCabe, "GameStop Mania Reveals Power Shift on Wall Street-and the Pros Are Reeling", *Wall St. J.* (Jan. 27, 2021 6:46 PM), *https://www.wsj.com/articles/gamestop-mania-reveals-power-shift-on-wall-streetand-the-pros-are-reeling-11611774663?mod=article-inline.*

[41] Alex Rampell and Scott Kupor, "Breaking Down the Payment for Order Flow Debate", Andreessen Horowitz (Feb. 17, 2021), *https://a16z.com/2021/02/17/payment-for-order-flow.*

[42] "Game Stopped? Who Wins and Loses When Short Sellers, Social Media, and Retail Investors Collide": Hearing Before the H. Comm. on Fin. Servs., 117 Cong. (Feb. 18, 2021) (statement

ket makers earning such high profits from PFOF, one is left to wonder if investors are truly better off under this model.

PFOF is a concerning practice that has been allowed to continue in the U.S. securities markets, although its costs to both retail investors and the markets overall outweigh the supposed benefits they receive. PFOF is innately conflicted, placing retail investors in an inferior position vis-a-vis their broker. Further, claims that PFOF results in price improvement are questionable at best and it is more likely that retail investors are often paying higher prices for their trades than they would if those orders were exposed to the exchanges. Lastly, PFOF increases market segmentation and decreases liquidity, which diminishes market stability and efficiency. Each of these is discussed in greater detail below.

A. PFOF Is Innately Conflicted and Opaque

Broker-dealers are bound by a duty of loyalty to their clients. This duty includes the duty to act in the best interests of their clients and obtain the best terms for their clients when executing trades. This duty of loyalty is delineated through SEC and FINRA rules, and numerous cases. PFOF directly undermines this duty by allowing brokers to route client orders based on agreements with third parties, allowing these third parties to profit at the expense of clients.

Previously, broker revenue was primary earned from their customers to whom they owe such a duty, aligning the interests of the brokers with their clients'. PFOF undermines this relationship because it pits the brokers' primary revenue source directly against the clients to whom they owe the duty of best execution. Under the PFOF model, brokers are incentivized to put their own profit-seeking interests above their clients in deciding where to route client orders. This practice greatly undermines the broker-investor relationship and leaves retail investors in a worse position.

Additionally, it is questionable whether brokers are truly getting the best execution for clients if they receive PFOF. To the extent brokers are required to put clients' interests above incentives for trade routing, as required by FINRA's rules regarding best execution,[43] PFOF is fundamentally at odds with this duty. Recent, separate actions by FINRA[44] and the SEC[45] against Robinhood for failure to achieve best execution, for example, would seem to bear this out.

Another related issue with the PFOF structure is the lack of transparency. SEC rules require brokers to report their PFOF statistics, including net payments received from market makers for trade execution and the rate of PFOF per 100 shares. These disclosures, which were recently amended in 2020, provide data in the aggregate that make it impossible for individual retailers to know specific, individualized information.

This lack of information makes it difficult for retail investors to compare costs across brokers and to appreciate the true costs of their trading activities.

Importantly, even though the SEC requires that these reports are made available to customers, it can be nearly impossible to locate them on the broker's website.[46] And, there are questions as to whether the reports some brokers provide even comply with the SEC regulations. It is imperative that the SEC mandate additional disclosure around this issue in order to make investors more informed about the costs of their allegedly free trading accounts.

Lastly, Congress should explore whether PFOF ought to be banned given its inherent incompatibility with best execution and brokers acting in the best interest of their clients. If a broker is able to cover its trading expenses through receipt of fractions of a penny per share from a third party, could it not simply charge its actual customer a similar price?

of Vladimir Tenev, CEO, Robinhood Markets, Inc.), prepared remarks available at *https://financialservices.house.gov/uploadedfiles/hhrg-117-ba00-wstate-tenevv-20210218.pdf.*

[43] Regulatory Notice 15-46: "Guidance on Best Execution Obligations in Equity, Options and Fixed Income Markets, FINRA" (Nov. 2015), *https://www.finra.org/rules-guidance/notices/15-46.*

[44] See, e.g., Letter of Acceptance, Waiver, and Consent No. 2017056224001 from Robinhood Fin., LLC., to Dept. of Enf't., FINRA (Dec. 19, 2019), *https://www.finra.org/sites/default/files/2019-12/robinhood-awc-121919.pdf.*

[45] "In the Matter of Robinhood Fin., LLC", Admin. Proc. File No. 3-20171 (Dec. 17, 2020), *https://www.sec.gov/litigation/admin/2020/33-10906.pdf.*

[46] Letter from Tyler Gellasch, Healthy Markets Ass'n, to Brent J. Fields, SEC, at 7-8, (Sept. 26, 2016), *https://healthymarkets.wpengine.com/wp-content/uploads/2018/04/09-26-16-HM-letter-Order-Handling-Disclosure-rules.pdf*; Annette L. Nazareth, Gregory Rowland, Zachary J. Zweihorn, and Mark A. Sater, "SEC Adopts Enhanced Order Handling Disclosure Requirements5", FINREG: Davis Polk Insights on Fin. Reg. (Nov. 27, 2018), *https://www.finregreform.com/single-post/2018/11/27/sec-adopts-enhanced-order-handling-disclosure-requirements.*

A ban on PFOF is unlikely to result in the end of retail investor participation in the market. But it can result in less conflicted order routing and adoption of a more transparent pricing model. Other jurisdictions, such as the United Kingdom and Australia, have banned PFOF because it is innately conflicted and of questionable benefit to investors.[47] FINRA has begun an examination of PFOF and the zero-commission business model because of their problematic incentive structures.[48] In light of the concerning features of PFOF, Congress and the SEC should explore whether its continuation is truly in the best interest of retail investors or in the best interest of brokers, wholesalers, and market makers.

B. Price Improvement Is Questionable

One of the main arguments in favor of PFOF is that the third parties to which brokers route orders purportedly provide retail customers with "price improvement." Often, market participants will (somewhat misleadingly) claim that "price improvement" means that retail customers are getting better prices than are available on exchanges. For example, Robinhood's CEO testified: "In fact, Robinhood customers received more than $1 billion in price improvement-the price they received compared to the best price on a public exchange-in the first half of 2020."[49]

But that is not what price improvement is often defined to calculate. Rather, "price improvement," as defined by SEC Rule 605 is not measured from the best available prices on exchanges, but rather the best available protected quote.[50] Odd-lot quotes (i.e., buy/sell offers for less than 100 shares) are generally not protected and, therefore, they are not used to calculate price improvement, even if they are a better price than the protected quote. Consequently, price improvement claims are often overstated and fail to reflect that many investors' executions were not at the best available prices, but were instead at prices that were inferior to odd-lot quotes on the exchanges.

Studies have also raised questions as to whether retail investors receive the best price when their orders are routed based on PFOF. A study by the U.K. financial regulator found that in removing broker payments for order routing, investor execution at the best available price increased from 65 percent to 90 percent.[51] A more recent study based on U.S. transactions in GameStop during the January trading frenzy estimated that price improvement estimates were cut in half when odd lots on just Nasdaq were included in the calculations.[52]

To improve the calculation of price improvement and actually enable investors to receive best execution, the SEC should immediately update Rule 605 to reflect odd-lots in the calculation of price improvement. There is little to no justification in the current market for excluding odd-lot quotes from the calculation of price improvement. And, there is even less justification for excluding it from determining the best available price for trade execution when the aggregated available odd lots are at least as great as a customer order.

It is also worth noting that it appears that different retail broker dealers appear to negotiate different amounts of price improvement for their customers. Further, the amounts of price improvement seem to be, in many cases, inversely related to the amount of payments received by the broker as part of its PFOF. It seems as though it should be obvious, but if one retail broker is routinely providing its customers with better prices than another, they can't both be providing "best execution."

Lastly, as discussed below, even using a more accurate calculation methodology, the "price improvement" statistic may still not reflect an improvement over a price that could have been received if the order had been routed to the lit markets. That's because if a retail order is routed to an exchange, it is likely that the order could receive mid-point trade executions that would offer far better prices than the price improvement currently offered.

[47] CFA Inst., "Payment Order Flow: Internalisation, Retail Trading, Trade-Through Protection & Implications for Market Structure" 2 (2016), *https://www.cfainstitute.org/-/media/documents/issue-brief/payment-for-order-flow.ashx* (discussing the U.K. ban on PFOF).

[48] "Targeted Examination Letter on Zero Commissions", FINRA (Feb. 2020), *https://www.finra.org/rules-guidance/guidance/targeted-examination-letters/zero-commissions.*

[49] "Game Stopped? Who Wins and Loses When Short Sellers, Social Media, and Retail Investors Collide: Hearing Before the H. Comm. on Fin. Servs., 117 Cong. (Feb. 18, 2021) (statement of Vladimir Tenev, CEO, Robinhood Markets, Inc.), prepared remarks available at *https://financialservices.house.gov/uploadedfiles/hhrg-117-ba00-wstate-tenevv-20210218.pdf.*

[50] SEC Rule 605, FINRA, *https://www.finra.org/rules-guidance/guidance/sec-rule-605* (last visited Mar. 7, 2021).

[51] CFA INST., supra note 47, at 2.

[52] Robert P. Bartlett, III & Justin McCrary, Modernizing Odd Lot Trading (on file with author).

C. Price Discovery and Market Liquidity Are Reduced

Another consequence of PFOF is that it results in significant market segmentation. Retail orders routed to a market maker, for instance, are typically filled by the market maker without ever trading on the exchanges. Given that retail trades account for an ever-increasing segment of the markets, isolating retail transactions to market makers with whom brokers have order routing arrangements reduces liquidity and price discovery for the rest of the markets.

In adopting Regulation National Market System ("Reg NMS"), the SEC sought to create a fair and transparent marketplace in which investors could trade at the best price available across the different venues trading a security.[53] The reality, however, is that the securities markets are more fragmented today than they were prior to the enactment of Reg NMS. There are over a dozen exchanges and dark pools, and hundreds of broker-dealers who fill customer order internally or route them according to prior arrangements.[54] Further compounding this fragmentation, it is estimated that close to 100 percent of retail orders are internalized and, therefore, never interact with the broader market in execution.[55]

Over the past several years, the amount of exchange trading has steadily declined as retail trading has increased. Over the past several weeks, as much as half of all trading has been occurring off-exchange.[56] This means that those orders are not contributing to price discovery. Pension funds, mutual funds, and other investors are generally unable to interact with them. Further, as discussed above, retail customers may not be receiving the best price available.

Relatedly, segmentation of retail transactions has reduced market liquidity, making it harder for institutional investors to trade.[57] Retail trades are inaccessible sources of liquidity, which has a significant effect on the cost to trade popular stocks that have a high percentage of retail ownership. Apple, for example, has an estimate retail share of 38 percent, which is unavailable to most institutional investors because the trades are fulfilled internally. As a result, institutional investors seeking to trade stock with high retail ownership face significantly higher costs because of diminished liquidity and increased volatility.[58]

Conclusion

Today, it is easier, cheaper and faster to trade more complex and leveraged financial products that ever before. This new market reality requires that we rethink the risks that accompany these developments and, in so doing, consider what types of markets we want to create and encourage from a policy perspective. Promoting and strengthening market stability and integrity is essential to the market fulfilling its fundamental purpose: efficiently allocating capital to businesses, driving the economy, and enabling investors to enjoy reasonable returns on their capital. Recent events have highlighted concerns and shortcomings in the existing market structure, which must be comprehensively addressed in order to ensure that the markets remain fair, stable, and accessible companies seeking capital and, most importantly, all investors.

PREPARED STATEMENT OF RACHEL J. ROBASCIOTTI

FOUNDER AND CHIEF EXECUTIVE OFFICER, ADASINA SOCIAL CAPITAL

MARCH 9, 2021

Mr. Chairman Brown, Ranking Member Toomey, and Members of the Committee: Good morning and thank you for inviting me to testify before this Committee. It is my great honor. My name is Rachel Robasciotti and I hold leadership positions at two SEC Registered Investment Advisory firms. I am the Founder and CEO of Adasina Social Capital, where we manage an exchange-traded fund with the ticker

[53] Div. Trading & Mkts., Responses to Frequently Asked Questions Concerning Rule 611 and Rule 610 of Regulation NMS, SEC, *https://www.sec.gov/divisions/marketreg/nmsfaq610-11.htm* (last updated Apr. 4, 2008).

[54] CFA Inst., "Dark Pools, Internalization, and Equity Market Quality" 2 (2012), *https://www.cfainstitute.org/en/advocacy/policy-positions/dark-pools-internalization-and-equity-market-quality*.

[55] Id. at 16.

[56] Alexander Osipovich, "GameStop Mania Highlights Shift to Dark Trading", *Wall St. J.* (Feb. 12, 2021, 5:33 AM), *https://www.wsj.com/articles/gamestop-mania-highlights-shift-to-dark-trading-11613125980*.

[57] "Meme Stocks: Inaccessible Trading Share, Trading Cost, and Risk", *Babelfish Analytics* (Feb. 5, 2021), *https://www.babelfishanalytics.com/news/2021/2/4/meme-stocks-inaccessible-trading-share-trading-cost-and-risk*.

[58] Id.

symbol JSTC. It holds over 800 stocks, but is accessible to everyday investors at a price of about $16 per share. I am also the Director of Advocacy & Engagement for Abacus Wealth Partners, a firm with $3.8 billion in assets and no minimum account size for its clients.

In both roles, I serve hardworking, everyday Americans. Your constituents and my clients are the same people.

I have also worked in financial services for almost 22 years, so I take the long view of market events. I have seen everything from the ill-fated dot-com boom of 2000 through the Great Recession and the most recent GameStop-Robinhood episode in January. I understand the players in the market and, in this most recent situation, there are three groups to consider.

1. *Hedge Funds:* Institutions that primarily manage money for wealthy, accredited investors[1] and are known for their risky strategies and high returns.

2. *Redditors:* Tech-enabled young people, using commission-free trading, who banded together to outwit the hedge funds they felt had an unfair advantage.

3. *Everyday Americans:* Hard-working people with long-term retirement savings invested in the stock market. These people do not have time to be sophisticated investors and were mostly anxious, confused, and frustrated.

But, as an investment professional, what happened here was familiar to me.

When the GameStop–Robinhood episode occurred in January, I was immediately reminded of the MIT Blackjack Team of the 1990s, when a group of students banded together to break the bank at several large casinos.[2] They realized that if they worked together, they could win substantially more money than the average gambler. So, using math skills and technology, they coordinated to quickly and strategically place large bets against the house.

It is easy to see the obvious similarities between the two situations. Like the MIT students, the Redditors in January were young, knowledgeable people with high appetites for risk who chose to collectively speculate by making quick bets against a larger player with a perceived advantage.

On the other hand, like the casinos, the hedge funds are large institutions with specialized knowledge about the game who some say routinely use their size to tip the odds in their favor.

What is not obvious, whether in the casino or the stock market, is what the wealthy institutions and upstarts have in common. They are all fast-moving, high-risk speculators with more skills and tools than the average person.

But there is a problem here for the stock market. When fast-moving, high-risk speculators dominate, we have a classic recipe for market disruptions. What we saw in January with GameStop and Robinhood is what we saw during the Great Recession with Wall Street churning out subprime, mortgage-backed securities.

Market disruptions like this are a problem because, as stated by SEC Commissioners on January 29th,[3] "...extreme stock price volatility has the potential to expose investors to rapid and severe losses and undermine market confidence."

Unfortunately, this volatility does not impact everyone equally. Let me paint the picture of what the everyday investor experienced. Imagine a two-job household with a couple of kids, adults working hard to make ends meet and save enough for the future. They don't have a professionally managed pension to fall back on for retirement, because so few pensions now exist.[4] They know that Social Security benefits their parents receive aren't enough to cover most retiree's basic needs.[5] And, for several decades now, the economy has only offered these savers historically low-interest rates, which means that putting their money in low-risk savings accounts, CDs, or bonds barely makes them enough to keep up with inflation.[6]

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[1] Securities and Exchange Commission, Office of Investor Education and Advocacy, "Investor Bulletin: Hedge Funds", SEC Pub. No. 139 (February 2013).

[2] Noah Goldman, "How MIT Students Broke the Bank in Vegas", ABC News (January 6, 2006).

[3] U.S. Securities and Exchange Commission, "Statement of Acting Chair Lee and Commissioners Peirce, Roisman, and Crenshaw Regarding Recent Market Volatility", Public Statements, U.S. Securities and Exchange Commission (January 29, 2021).

[4] Barbara A. Butrica, Howard M. Iams, Karen E. Smith, and Eric J. Toder, "The Disappearing Defined Benefit Pension and Its Potential Impact on the Retirement Incomes of Baby Boomers" Office of Retirement and Disability Policy, Social Security Administration, Social Security Bulletin, Vol. 69, No. 3 (October 2009).

[5] Jan Mutchler and Yang Li, "The Gap Remains: Social Security Benefits Continue to Fall Short of Covering Basic Cost of Living for Older Americans, 2015-2020", Center for Social and Demographic Research on Aging Publications, No. 48, University of Massachusetts Boston (November 2020).

[6] *The Economist*, "The Savers Dilemma: Low Interest Rates Leave Savers With Few Good Options", Finance & Economics, *The Economist* (October 15, 2020).

This leaves investing in the stock market as their only option. It is the only way their savings can grow enough to provide for the future. So, they are forced into the "stock market casino" with their life savings. And they are being required to play against armies of sophisticated, high-risk hedge funds and Redditors duking it out for dominance. With smaller amounts, that represent all that they have to invest, sustaining significant losses (or even the perception of losses) is devastating. It makes them lose confidence and want to opt out altogether. But we know they can't leave the casino.

As an investment professional who works for everyday investors, and as senators with these same people as your constituents, we must fix the system for them. We need to maintain fair, orderly, and efficient markets that serve as a reasonable place for the average American to invest their life savings. And we have a duty to protect these investors from the crossfire of fast-moving, high-risk speculators.

PREPARED STATEMENT OF TERESA GHILARDUCCI

BERNARD L. AND IRENE SCHWARTZ PROFESSOR OF ECONOMICS, THE NEW SCHOOL

MARCH 9, 2021

Thank you for inviting me, Chairman Brown and Ranking Member Toomey and Members of the Committee.

I am the Bernard Schwartz Chair of Economics at The New School in New York City, coming to that faculty in 2007 after teaching at the University of Notre Dame for 25 years. I received my PhD from UC Berkeley and serve as a court-appointed independent trustee of the Goodyear tire retirees' $900 million health care trust fund and the autoworkers $60 Billion retiree health fund.

My office hours are typically quiet moments huddling over equations. But over the past few years, students have been bubbly, asking about their trades on the phone-friendly trading platform, Robinhood. The young are told to buy stocks and hold them—but they absorbed the first point and missed the second.

Trading on Robinhood is a game with psychologically powerful intermittent rewards and is disconnected to long term wealth accumulation. Phone Apps makes trading easy and cheaper and superficially seems to open securities markets to many more people but they do not produce wealth.

I welcome today's hearing seeking to protect retail stock buyers from casino-type trades. And I want to emphasize that Americans' wealth does not come from retail stock trading. I am here to testify where Americans really get their wealth. [1]

As you might guess, home equity and retirement wealth including Social Security [2] are the largest components of wealth [3]—they make up 88 percent [4] of the wealth held by near retiree households in the lower half of the wealth distribution; 78 percent for the middle class, and 43 percent for those in the top 10 percent (Table 2).

You might be surprised that Social Security is the most important source of household wealth for half of all households with workers nearing retirement. Social Security represents 58 percent of net wealth for near retirees in the bottom half of the wealth distribution; 27 percent for the middle class; and 7 percent for the top 10 percent. [5]

In contrast, directly owned stocks (and bonds) make up a relatively small share of near retirees' wealth at 8 percent. Only 24 percent of older households own stocks directly, outside of their retirement account and that ownership is concentrated at the top. Only 10 percent of those in the bottom half of the wealth distribution own stocks, less than a third of the middle class.

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[1] Researchers at The New School, Michael Papadopoulos and Siavash Radpour, constructed the wealth data and Owen Davis helped with the Robinhood discussion.

[2] We add the shares in the net value of primary residence, present value of expected Social Security benefits, value of DC plans and IRAs, and present value of defined benefit benefits.

[3] Half of near-retirement households (with members aged 52 or over), those in the bottom half of the wealth distribution have less than $296,000 wealth, including the value of their pensions and Social Security benefits. The median wealth for the middle class—those in the next 40 percent of the wealth distribution—is $1.02 million. Households in the top 10 percent have a median net wealth of over $3.2 million (Table 1).

[4] Adding 19%+58%+11%=88%

[5] A note about the racial wealth gap and Social Security. Whites, on average, have 83 percent more net wealth (Table 3) that non-whites. But the racial Social Security wealth gap is only 13 percent—Social Security is the most equitably distributed source of wealth for Americans nearing retirement. Whites have 8 times the wealth in business, and 4 times the wealth in directly held stocks, 58 percent more housing wealth and 2.4 times the retirement plan wealth compared to non-whites

And the wealthy are not rich because they directly own stocks. Though 70 percent of the top 10 percent directly own stocks, it is only 13 percent of their wealth. (They own businesses (15 percent of their wealth), other real estate (15 percent of their wealth), and have 25 percent of their wealth in retirement accounts and pension plans.)

As Nobelist Robert Shiller recent book points out stock trading feeds a narrative, a story about wealth, trading is exciting because stocks fluctuate. Stories about getting rich on stocks produce a fiction that stock trading creates wealth, when, in fact, retail investors fuel bubbles.

Defenders of Robinhood and widespread trading have purchase because in the COVID recession people who own stocks have done well, which heightens the fear of missing out for those not buying stocks. The reality is they are being left out because they don't have access to retirement accounts, which is where most of us who own stocks hold them. Retirement accounts are invested in diversified portfolios managed by institutional investors and professionals who can manage the risks that come with investments in private equity, etc., and other complex instruments.

But more than half of workers do not have a retirement plan at work, which means many households do not have any investment in stocks or are accumulate private wealth for their retirement. (Radpour, Papadapoulos, and Ghilarducci 2021).

Any retail brokers' claims that trading democratizes access to wealth only takes advantage of people's fears. I do not recommend opening up high-risk and expensive alternative investments to the retail investor it can make risk and inequality worse. [6]

Robinhood founders frequently invoke their experience as part of the Occupy movement to explain why they want to democratize finance. But safe and professionally managed diversified investments, not trading apps, are the path to economic security. Successful investors know that "time in the market" and diversification, which are among the many benefits of professionally managed retirement plans, are what works. Unlike "timing the markets," which does not work, yet is that is what trading apps encourage.

We need innovations in public policy to give more Americans access to what we know works—professionally managed retirement coverage that allows everyone to benefit from the stock markets the same way you and I do in Thrift Savings Plan, in a private or public defined benefit plan, or in my pension plan Teachers Insurance Annuity Association.

Wealth Holdings

The typical household whose members are nearing retirement earn about $65,000, their average wealth of over $1 million is barely relevant since the very wealthy pull up the average beyond reality. Because most Americans do not have significant wealth until their fifties, I focus today on those nearing retirement age, defined as households with one worker 52 or over.

The typical near-retirement household in the United Statesearns between $55,000 to $75,000 per year and has an average net wealth of $1.67 million. I don't report the income distribution tables, but am reporting the wealth distribution. When dividing up the over near retiree population This sounds like a large number, but—as you know—averages hide important differences (as witnesses testified in your March 3 hearing) and means and medians don't give you a complete picture. So I am going to report wealth in terms of wealth distribution, looking at the differences between those in the bottom 50 percent, the next 40 percent and the top 10 percent of the wealth distribution. (These are categories recommended by French economist Thomas Piketty (2015).

For those in the bottom half of the wealth distribution, the median net wealth is $295,724; for those in the next 40 percent, it is $1,019,239; and for those in the top 10 percent, median net wealth is $3.19 million. You may be surprised that home equity in a primary residence is not the largest share of wealth across all income groups. It is only 12 percent of net wealth for those in the top 10 percent (they own other real estate) and about 20 percent for the bottom 90 percent.

Social Security is the predominant source of household wealth for near retirees. As a promised stream of income for the rest of your life, indexed to inflation, Social Security represents 24 percent of net wealth, which falls as income goes up. Social

[6] Demand for lottery-like stocks increases during economic downturns and is more prevalent among vulnerable groups: poor young men, African Americans and Latinos. (Kumar 2009) Some types of retail trading resemble gambling disorders. (Grall-Bronnec et al. 2017). New technologies make stock trading more like gambling. Apps like Robinhood make gambling stocks more accessible. Two to three percent of gamblers become addicted. Trading can become an addiction, akin to gambling addiction.

Security matters much more for lower wealth holders who are likely lower earners: 58 percent of total wealth is in Social Security for the bottom half of the wealth distribution, 27 percent for the middle and 7 percent for those at the top. Retirement savings in the form of defined contribution savings plans and individual retirement accounts are next, representing 17 percent of households net wealth, only 8 percent on the bottom, 21 percent for middle and 16 percent for those on the top. Traditional pensions, or benefits from a defined benefit plan, represent only at 8 percent because they have been replaced by 401(k)s, only 3 percent for the bottom and 9 percent for the top half.

Table 1: Mean and Median Wealth by Wealth Percentile Group for Households with At Least One Worker Over 52

	Mean				Median			
	All	Bot. 50%	Next 40%	Top 10%	All	Bot. 50%	Next 40%	Top 10%
Primary Residence net of mortgage debt	178,758	63,472	234,469	533,339	105,000	38,000	180,000	400,000
Other Real Estate net of mortgage debt	95,838	7,254	58,810	677,822	0	0	0	160,000
Vehicles net of car loans	22,273	14,099	27,727	41,376	15,000	9,000	20,000	27,000
Social Security	253,525	196,600	307,671	321,702	254,044	192,604	300,124	274,966
Retirement Savings and Benefits (DC, DB, IRA)	270,226	37,314	343,114	1,135,697	51,000	0	237,800	823,000
Business (net)	82,950	2,618	32,280	689,153	0	0	0	0
Stocks	82,361	4,212	49,709	605,311	0	0	0	140,000
Bonds	12,786	191	2,651	116,630	0	0	0	0
Checking/Savings Accounts	38,790	8,879	44,568	165,598	7,000	2,000	15,000	50,000
CDs, Savings Bonds, T-Bills, and Other Savings	35,855	4,426	28,243	224,020	0	0	0	5,000
Total Wealth	1,073,362	339,065	1,129,242	4,510,648	600,824	303,844	1,025,924	3,189,109
Non Real Estate Debt	8,285	47	7,173	5,240	0	0	0	0
Net Wealth	1,065,077	339,018	1,122,069	4,505,408	594,049	295,724	1,019,239	3,188,181

Source: Michael Papadopolous et. al. calculation using the Health and Retirement Study 2016 wave.
Notes: Stock and bond categories represent direct ownership (i.e., outside of 401(k)-type plans). Wealth cutoffs for single households are $319,000 and $1,227,915. Wealth cutoffs for married households are $736,049 and $2,526,249. Amounts for defined benefit plans and Social Security benefits reflect the present value of expected benefits in retirement assuming retirement and claiming at Full Retirement Age. Values for real estate reflect net equity (value of home minus mortgage debt).

Table 2: Share of Total Wealth and Share Having Any Wealth in Category by Wealth Percentile Group for Households with At Least One Worker Over 52

	Share Having Any				Share of Net Wealth			
	All	Bot. 50%	Next 40%	Top 10%	All	Bot. 50%	Next 40%	Top 10%
Primary Residence net of mortgage debt	78%	64%	91%	98%	17%	19%	21%	12%
Other Real Estate net of mortgage debt	28%	16%	34%	61%	9%	2%	5%	15%
Vehicles net of car loans	89%	85%	93%	95%	2%	4%	2%	1%
Social Security	100%	100%	100%	100%	24%	58%	27%	7%
Retirement Savings and Benefits (DC, DB, IRA)	66%	46%	85%	96%	25%	11%	31%	25%
Business (net)	11%	5%	13%	31%	8%	1%	3%	15%
Stocks	24%	10%	31%	70%	8%	1%	4%	13%
Bonds	5%	1%	6%	22%	1%	0%	0%	3%
Checking/Savings Accounts	83%	75%	91%	96%	4%	3%	4%	4%
CDs, Savings Bonds, T-Bills, and Other Savings	27%	16%	34%	55%	3%	1%	3%	5%

Source: Michael Papadopolous et. al. calculation using the Health and Retirement Study 2016 wave.
Notes: Stock and bond categories represent direct ownership (i.e., outside of 401(k)-type plans and IRAs). Wealth cutoffs for single households are $319,000 and $1,227,915. Wealth cutoffs for married households are $736,049 and $2,526,249.

Table 3: Descriptive Statistics for Wealth by Race of Household Head for Households with At Least One Worker Over 52

	Mean		Median		Share Having Any		Share of Net Wealth	
	White	Nonwhite	White	Nonwhite	White	Nonwhite	White	Nonwhite
Primary Residence net of mortgage debt	193,084	122,524	120,000	60,000	82%	64%	16%	19%
Other Real Estate net of mortgage debt	100,618	77,080	0	0	29%	22%	9%	12%
Vehicles net of car loans	23,821	16,199	15,000	10,000	92%	78%	2%	3%
Social Security	259,594	229,702	261,724	215,644	100%	100%	22%	36%
Retirement Savings and Benefits (DC, DB, IRA)	304,893	129,102	82,918	0	71%	46%	26%	20%
Business (net)	100,936	12,346	0	0	12%	6%	9%	2%
Stocks	97,348	23,533	0	0	27%	13%	8%	4%
Bonds	15,529	2,022	0	0	6%	2%	1%	0%
Checking/Savings Accounts	43,763	19,265	9,000	1,500	87%	67%	4%	3%
CDs, Savings Bonds, T-Bills, and Other Savings	41,563	13,453	0	0	29%	17%	4%	2%
Total Wealth	1,181,149	645,226	675,166	387,604				
Non Real-Estate Debt	8,318	8,153	0	0				
Net Wealth	1,172,831	637,073	667,924	376,204				

Source: Michael Papadopolous et. al. calculation using the Health and Retirement Study 2016 wave.

Notes: Stock and bond categories represent direct ownership (i.e., outside of 401(k)-type plans). Amounts for defined benefit plans and Social Security benefits reflect the present value of expected benefits in retirement assuming retirement and claiming at Full Retirement Age. Values for real estate reflect net equity (value of home minus mortgage debt).

Policy Implications

Overall, I think the focus on broader wealth accumulation and retirement assets is the right way to go. We need to add accrued Social Security benefits to retirement wealth which helps reduce the retirement wealth gap between low and high earners and keeps retirees out of poverty, American workers still face a wealth crisis. Policymakers need to strengthen and expand Social Security and mandate employer-sponsored retirement plans to ensure universal coverage and adequate retirement income. Policymakers need to pay attention to the risks of student debt and home mortgages. We need better regulation of Fin tech to be sure, the future generation depends on our stewardship. The most important source of savings, though, is income, savings are a residual from people's earnings. They can't buy a house and contribute to a pension without decent earnings. This is not a rhetorical point, it is rooted in economic research on savings. We need to increase minimum wage and raise wages.

Social Security Wealth

Social Security reduces—but does not eliminate—retirement wealth inequality. For typical workers age 51-56, accrued Social Security benefits exceed employer-sponsored retirement wealth. Median Social Security wealth amounts to $81,900 compared with $67,000 in employer-sponsored retirement plans.

At ages 51-56, the typical low-wage worker (in the lowest 20 percent of earnings) has no retirement wealth. The typical high-wage worker (in the highest 20 percent of earnings) has wealth equal to almost two and a half times their earnings.

Adding accrued Social Security benefits to retirement wealth decreases the retirement wealth gap between low and high earners from two and a half times earnings to just over half a year's earnings (see Ghilarducci, Radpour, and Webb 2020).

To calculate Social Security wealth for this testimony, I impute a career earnings trajectory for each worker using two factors: (1) current earnings in the survey year [2016] and (2) scale factors from a Social Security Administration Actuarial Note published by Clingman and Burkhalter (2016). This career earnings trajectory is then used to calculate AIME and PIA, giving us the Social Security Retired Worker benefit. We assume all workers claim the Retired Worker benefit. We assume a worker collects benefits for 13 years, and therefore multiple annual benefits by 13—the actuarial factor (Carlson 2020), giving us an estimate for Social Security wealth.

Trading and Investment

It's well-known that individual investors underperform on average, and app-based day-trading may be making this performance gap between underperforming app

trading and other portfolios worse. In general, retail investors' returns are lower on average than returns to low-cost index funds and certainly less rewarding in terms of risk—adjusted returns to a professionally managed defined benefit portfolio. (Barber and Odean, 2013).

Retail investors tend to sell good stocks too soon and hold bad stocks too long—the endowment effect—and engage in myopic and salient trading patterns (a recent event is viewed as more likely to happen than it is) and they tend not to be diversified enough, professionals with a broad information base have more holdings.(Barber and Odean, 2013).

Recent evidence using Robinhood data finds that frequently bought stocks on the app seriously underperform due to what authors call "extreme herding" events (Barber et al., 2021). And a recent study using data on German households found that switching from desktop computers for investing to smartphone apps led investors to "increased purchasing of riskier and lottery-type assets and chasing past returns" (Kalda et al., 2021).

Fintech is not all bad—Apps like Betterment, Wealthfront, and Acorns are geared more toward patient, long-term investing than impulsive day trading. Owen Davis, graduate student at the New School helped with this section.

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PREPARED STATEMENT OF MICHAEL S. PIWOWAR

EXECUTIVE DIRECTOR, MILKEN INSTITUTE CENTER FOR FINANCIAL MARKETS

MARCH 9, 2021

Good morning. Thank you Chairman Brown, Ranking Member Toomey, and Members of the Committee for inviting me to testify today.

My name is Mike Piwowar, and I am the Executive Director of the Milken Institute Center for Financial Markets.[1] I had the pleasure of serving on this Committee's staff as Chief Economist for Senator Shelby and Senator Crapo. I also served as a Visiting Academic Scholar, Senior Financial Economist, Commissioner, and Acting Chairman of the U.S. Securities and Exchange Commission ("SEC" or "Commission"). I am testifying today on my own behalf.

Now that the dust has settled after the January trading frenzy on Gamestop and other so-called meme stocks, I am glad that you called this hearing on the state of retail investing.

Retail investors enjoy more choices and face lower costs and barriers when investing their hard-earned savings than ever before.

Retail investors can invest directly in securities through brokerage accounts. Competition among brokers has led to commission-free trading. Competition among exchanges, alternative trading systems (ATSs), and market makers has led to the best market quality environment—transaction costs are low, market depth is high, and execution speeds are fast—for publicly traded securities in history.[2] Retail investors can make their own investment decisions or seek the advice of a regulated investment professional through a broker-dealer or investment adviser.

Retail investors can achieve low-cost diversification and professional management by indirectly investing in the stock market through passively—and actively—managed mutual funds and exchange-traded funds (ETFs). Competition among funds has brought fees and expenses down to their lowest levels in history.[3] The widespread availability of retirement savings accounts such as 401(k) plans and individual retirement accounts (IRAs) also allows low-cost access to the stock market.

Retail investors have taken advantage of these beneficial trends over the past few decades. The percentage of U.S. households that own stocks—directly or indirectly through funds and retirement savings accounts—increased from 32 percent in 1989 to 53 percent in 2019.[4] Low-income households still lag high-income households in stock ownership rates, but low-income households saw the biggest gains over this period.[5] [6]

However, the SEC could make regulatory changes to improve the retail investing landscape. The January trading frenzy and the related difficulties faced by some brokerage customers highlighted a few areas that require the SEC and this Committee's immediate attention.

The Commission has already said that they are reviewing actions taken by regulated entities to determine whether they may have disadvantaged investors or otherwise unduly inhibited their ability to trade certain securities.[7] The Commission also said that they are investigating whether abusive or manipulative trading activity prohibited by the Federal securities laws occurred during this episode.[8]

I have complete confidence that the Commission and its staff will identify and pursue any evidence of noncompliance or wrongdoing. Accordingly, I focus my testimony on the market structure and market infrastructure[9] issues that have been

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[1] The Milken Institute is a nonprofit, nonpartisan think tank that promotes evidence-based research that serves as a platform for policymakers, industry practitioners, and community members to come together in catalyzing practical solutions to challenges we face both here in the U.S. and globally. The Center for Financial Markets conducts research and constructs programs designed to facilitate the smooth and efficient operation of financial markets—to help ensure that they are fair and available to those who need them when they need them.

[2] See, e.g., "A Century of Stock Market Liquidity and Trading Costs", Charles M. Jones (May 23, 2002), available at *https://papers.ssrn.com/sol3/papers.cfm?abstract-id=313681*; "Equity Trading in the 21st Century", James J. Angel, Lawrence E. Harris, and Chester S. Spatt, *Quarterly Journal of Finance*, Vol. 1, No. 1 (2011); and "Equity Trading in the 21st Century: An Update", James J. Angel, Lawrence E. Harris, and Chester S. Spatt (May 23, 2013), available at *https://www.q-group.org/wp-content/uploads/2014/01/Equity-Trading-in-the-21st-Century-An-Update-FINAL.pdf*.

[3] See, e.g., "2020 Investment Company Fact Book: A Review of Trends and Activities in the Investment Company Industry", available at *https://www.ici.org/research/stats/factbook*.

[4] See "Federal Reserve Board 2019 Survey of Consumer Finances" (Nov. 17, 2020), available at *https://www.federalreserve.gov/econres/scfindex.htm*.

[5] See "Main Street Owns Wall Street, ICI Viewpoints", Sarah Holden and Michael Bogdan (Feb. 10, 2021), available at *https://www.ici.org/viewpoints/21-view-equityownership*.

[6] The Milken Institute Center for Financial Markets is actively engaged in research, programs, and events to provide for more equitable access to capital for job-creating businesses and more equitable access to investments by retail investors.

[7] Statement of Acting Chair Lee and Commissioners Peirce, Roisman, and Crenshaw Regarding Recent Market Volatility (Jan. 29, 2021), available at *https://www.sec.gov/news/public-statement/joint-statement-market-volatility-2021-01-29*.

[8] Id.

[9] The term "market structure" (or "market microstructure") generally refers to the operation and regulation of financial markets. The term "market infrastructure" (or "market plumbing")

raised in the aftermath of the January trading. Before addressing specific issues, I summarize some guiding principles that I find useful in thinking through them.

Guiding Principles for Market Structure and Market Infrastructure Policy

There Are No Solutions; There Are Only Trade-offs [10]

The regulatory framework of the U.S. equity markets is complicated; it reflects a complex system of legal and regulatory decisions that have been made over decades. The markets have evolved within this framework into a highly interconnected system.

As a result, any change to market structure policy in one area will likely affect other areas. For example, if payment for order flow were restricted or banned, zero-commission trades would likely disappear. This is one tradeoff that the Commission will have to weigh when deciding whether and, if so, how to make any changes in existing regulation of payment for order flow arrangements. Changes to existing market structure and market infrastructure policy always involve tradeoffs.

Economic Analysis Is a Particularly Useful Tool

The lens of economic analysis is well-suited for evaluating tradeoffs. While serving as an SEC commissioner, I found my economics training was a valuable tool on virtually every regulatory and enforcement decision I had to make.

In 2012, the Commission recognized the importance of going beyond statutory obligations mere quantitative exercises to incorporate comprehensive economic analysis in the rulemaking process by adopting "Current Guidance on Economic Analysis in SEC Rulemaking" (Current Guidance). [11] The Guidance was adopted under SEC Chairman Mary Schapiro. It has been followed on a bipartisan basis by Chair Mary Jo White, myself as Acting Chairman, and Chairman Jay Clayton. [12] I was glad to see that SEC-nominee Gary Gensler committed to following the Current Guidance in response to a question during last week's nomination hearing.

The SEC's Current Guidance requires the Commission to evaluate a rule's likely economic consequences, including potential negative unintended consequences. It requires the Commission to compare a proposed regulatory action with reasonable alternatives, including the alternative of not adopting a rule.

Because U.S. equity markets and their regulatory framework are so complex, the SEC's Current Guidance is a particularly useful tool when evaluating any potential changes to market structure and market infrastructure policy.

Frequent Retrospective Reviews of Existing Rules Are Necessary

The only constant in financial markets is change. Markets and technologies are continually evolving. If we want our capital markets to remain the envy of the world, our regulatory framework needs to evolve with them.

Throughout my tenure as an SEC commissioner, I was an outspoken advocate of retrospective reviews of Commission rules. [13] I believe it is a fundamental best practice of good government to observe how the Commission's regulations work in the real world. Armed with this information, the Commission can propose thoughtful improvements to its rules to advance the Commission's essential work to protect investors, maintain fair, orderly, and efficient markets, and promote capital formation.

I am not alone in this view. For example, the Regulatory Flexibility Act of 1980 requires agencies such as the Commission to perform a periodic review of rules that

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generally refers to the network of systems that facilitate financial market transactions, such as payment systems, clearance, and settlement.

[10] This phrase is often attributed to Thomas Sowell.

[11] "Current Guidance on Economic Analysis in SEC Rulemaking", (Mar. 16, 2012), available at *http://www.sec.gov/divisions/riskfin/rsfi-guidance-econ-analy-secrulemaking.pdf*.

[12] The Commission has not proposed or adopted any new rules under current Acting Chair Allison Herren Lee.

[13] See, e.g., "Advancing and Defending the SEC's Core Mission", Speech by Commissioner Michael S. Piwowar at the U.S. Chamber of Commerce (Jan. 27, 2014), available at *https://www.sec.gov/news/speech/2014-spch012714msp*; Remarks to the Securities Enforcement Forum 2014, Speech by Commissioner Michael S. Piwowar (Oct. 14, 2014), available at *https://www.sec.gov/News/Speech/Detail/Speech/1370543156675*; Statement Regarding Publication of List of Rules to be Reviewed Pursuant to the Regulatory Flexibility Act, Public Statement by Commissioner Michael S. Piwowar (Sept. 15, 2016), available at *https://www.sec.gov/news/statement/piwowar-statement-list-of-rules-regulatory-flexibility-act.html*; Remarks at FINRA and Columbia University Market Structure Conference, Speech by Commissioner Michael S. Piwowar (Oct. 26, 2017), available at *https://www.sec.gov/news/speech/speech-piwowar-2017-10-26*; and Statement of Commissioner Piwowar at Open Meeting Regarding Amendments to the Commission's Whistleblower Program Rules, Commissioner Michael S. Piwowar (June 28, 2018), available at *https://www.sec.gov/news/public-statement/statement-piwowar-whistleblower-062818*.

have or will have a significant economic impact upon a substantial number of small entities within ten years of the publication of such rules as final rules "to determine whether such rules should be continued without change, or should be amended or rescinded."[14] The Regulatory Flexibility Act identifies the following factors for analysis: (1) the continued need for the rule; (2) the nature of complaints or comments received concerning the rule from the public; (3) the complexity of the rule; (4) the extent to which the rule overlaps, duplicates, or conflicts with other Federal rules, and, to the extent feasible, with State and local governmental rules; and (5) the length of time since therule has been evaluated or the degree to which technology, economic conditions, or other factors have changed in the area affected by the rule.[15]

In 2011, President Obama signed an Executive Order to enhance the Regulatory Flexibility Act's goals by directing independent agencies such as the SEC to develop and implement a plan to conduct ongoing retrospective analyses of existing rules.[16] The stated goal is "to determine whether any such regulations should be modified, streamlined, expanded, or repealed so as to make the agency's regulatory program more effective or less burdensome in achieving the regulatory objectives."[17]

Because markets and technologies are continually evolving, frequent retrospective reviews of market structure and market infrastructure rules by the Commission are necessary to ensure that they are not outdated, obsolete, or overly burdensome.

Specific Issues

The Trade Settlement Cycle

When a retail (or institutional) customer buys or sells a security through a broker, the broker routes the order to a trading venue for execution and then submits the resulting trade to the Depository Trust and Clearing Corporation (DTCC) for clearance and settlement. In the United States, most securities transactions take two days (T+2) to settle. To mitigate the market, liquidity, counterparty, and systemic risks associated with the delay in settlement, DTCC requires brokers to post margin using their own funds.

On January 28, 2021, Robinhood received a notice from DTCC that Robinhood owed a net deposit of approximately $3 billion.[18] After discussions with Robinhood staff in which Robinhood notified DTCC that it would impose trading restrictions in GameStop and other securities, DTCC reduced the net deposit to approximately $1.4 billion.[19] To put that number in context, it represented nearly ten times the amount required just three days earlier.[20]

This incident has caused many investors to ask important questions. Why does the transfer of ownership for most securities transactions in the U.S. occur two business days after the trade date? Why haven't we already moved to T+1 or T+0? I believe I am in a unique position to answer those questions. That is why I published an op-ed in The Wall Street Journal last month.[21]

As Acting Chairman of the SEC, I led the effort in 2017 to move officially from T+3 to T+2.[22] At that time, T+2 was the best option based on economic analysis. The financial system was not yet prepared in 2017 to move to T+1, but it was ready to take a good first step toward greater efficiency and timeliness.

The change to T+2 was a success. Retail investors benefitted from quicker access to cash and securities when their trades were executed. The change reduced the

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[14] 5 U.S.C. 610.

[15] 5 U.S.C. 610(b).

[16] See Executive Order 13579—Regulation and Independent Regulatory Agencies (July 11, 2011), available at *https://obamawhitehouse.archives.gov/the-press-office/2011/07/11/executive-order-13579-regulation-and-independent-regulatory-agencies*. See also M-11-28—Memorandum for the Heads of Independent Regulatory Agencies (July 22, 2011), available at *https://obamawhitehouse.archives.gov/sites/default/files/omb/memoranda/2011/m11-28.pdf.*

[17] Id.

[18] See Testimony of Vladimir Tenev Robinhood Markets, Inc., "Game Stopped? Who Wins and Loses When Short Sellers, Social Media, and Retail Investors Collide", Hearing before the U.S. House Financial Services Committee (Feb. 18, 2021), available at *https://financialservices.house.gov/calendar/eventsingle.aspx?EventID=407107.*

[19] Id.

[20] Id.

[21] See "It's T-0 to Go Faster Than T+2", *The Wall Street Journal*, Opinion/Commentary, Michael S. Piwowar (Online Version—Feb. 24, 2021, Print Version—Feb. 25, 2021), available at *https://www.wsj.com/articles/its-t-0-to-go-faster-than-t-2-11614207705.*

[22] See "SEC Adopts T+2 Settlement Cycle for Securities Transactions", Press Release (Mar. 22, 2017), available at *https://www.sec.gov/news/press-release/2017-68-0*. See also "Statement at Open Meeting Regarding Amendment to Shorten the Trade Settlement Cycle", Public Statement, Acting Chairman Michael S. Piwowar (Mar. 22, 2017), available at *https://www.sec.gov/news/public-statement/piwowar-open-meeting-032217.*

dangers from market, liquidity, counterparty, and systemic risks across the financial system.

Recognizing that eventually moving to T+1 could have similar benefits, the Commission directed the staff in the final rule to undertake to submit a report to the Commission by September 2020.[23] The specific language in the final rule stated:

"This report will include, but not be limited to an examination of:

(i) the impact of today's amendment to Rule 15c6-1(a) to establish a T+2 standard settlement cycle on market participants, including investors;

(ii) the potential impacts associated with movement to a shorter settlement cycle beyond T+2;

(iii) the identification of technological and operational improvements that can be used to facilitate a movement to a shorter settlement cycle; and

(iv) cross-market impacts (including international developments) related to the shortening of the settlement cycle to T+2."[24]

Recommendations for the Trade Settlement Cycle

As I recommend in my op-ed, the SEC should release the staff report and open a comment file on its website for public feedback. The SEC should hold a public forum to discuss lessons learned from the recent events so that we all have the benefit of the most up-to-date information.

But, the SEC cannot move beyond T+2 on its own. Bank regulators will need to be involved because shortening the length of time between when a trade is executed and when securities and cash are delivered to the buyer and seller, respectively, will require improvements in the speed of bank payment systems.[25] [26]

Accordingly, the Treasury Secretary should convene a principals meeting of the Financial Stability Oversight Council, the Federal financial regulators' coordinating body, and initiate a securities settlement workstream. The purpose of the workstream is to coordinate regulatory efforts related to whether and how to shorten the settlement cycle.

Payment for Order Flow

The SEC allows brokers to have a choice of which trading venue to direct their customers' orders. The broker may direct the order to the exchange where the stock is listed, a different exchange or alternative trading system, or a market maker.

The SEC also allows brokers to enter into payment for order flow arrangements. Market makers may pay brokers for routing orders to them so long as they fulfill their best execution obligations. A broker must consider multiple factors when seeking best execution of customers' orders, including the opportunity to get a better price than what is currently quoted (price improvement), the speed of execution, and the likelihood that the trade will be executed.[27]

Payment for order flow arrangements could represent a conflict of interest between their broker and their customer. Brokers may choose to route customer orders to the market maker that offers the highest payment to the broker rather than to the trading venue that offers the best execution for the customer. However, the SEC's best execution requirements mitigate this conflict of interest. The SEC and FINRA regularly conduct examinations of broker-dealers for compliance with best execution obligations and bring enforcement actions when they find violations.[28]

Were Robinhood customers who traded GameStop stock in January 2021 advantaged or disadvantaged by Robinhood's payment for order flow arrangements?

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[23] See "Securities Transaction Settlement Cycle", Final Rule, SEC Release No. 34-80295 (Mar. 22, 2017), 82 FR 15564 Mar. 29, 2017), available at *https://www.sec.gov/rules/final/2017/34-80295.pdf*.

[24] Id.

[25] See, e.g., "We Shouldn't Have To Wait for FedNow To Have Faster Payments", *American Banker—BankThink*, George Selgin and Aaron Klein (Feb. 28, 2020), available at *https://www.americanbanker.com/opinion/we-shouldnt-have-to-wait-for-fednow-to-have-faster-payments*.

[26] In addition, regulators will need to carefully coordinate the foreign exchange (FX) settlement cycle for market participants who rely on FX settlements to fund cross-border securities transactions.

[27] See "Fast Answers—Best Execution", (May 9, 2011), available at *https://www.sec.gov/fast-answers/answersbestexhtm.html*.

[28] See, e.g., "FINRA Fines Robinhood Financial, LLC $1.25 Million for Best Execution Violations", News Release (December 19, 2019), available at *https://www.finra.org/media-center/newsreleases/2019/finra-fines-robinhood-financial-llc-125-million-best-execution*, and "SEC Charges Robinhood Financial With Misleading Customers About Revenue Sources and Failing to Satisfy Duty of Best Execution", Press Release (Dec. 17, 2020), available at *https://www.sec.gov/news/press-release/2020-321*.

Currently available public information does not allow for a direct analysis of the execution quality that specific Robinhood customers received on their GameStop orders in January 2021. However, analysis of two SEC-required disclosures can shed some light on the issue of whether retail investors, on average, across all brokers, received price improvement on their GameStop orders in January 2021.

SEC Rule 606 under Regulation NMS requires broker-dealers to provide quarterly disclosures of information regarding the handling of their customers' orders.[29] Using Robinhood's Rule 606 report for the fourth quarter of 2020, I determined that the three venues where Robinhood routed most of its orders were Citadel Execution Services, G1 Execution Services, and Two Sigma Securities. Robinhood discloses on its Rule 606 report that it receives payment from these venues to direct equity order flow.

SEC Rule 605 under Regulation NMS requires market centers that trade NMS stocks to make available to the public monthly electronic execution reports that include uniform execution quality measures.[30] Market centers report these measures separately for each stock, but those measures are aggregated across all broker-dealers who route to them. Using the Rule 605 reports for January 2021 of each of the three venues above, I calculated their execution quality statistics for their order executions of GameStop stock. See Table 1 below.

Table 1: Execution Quality Statistics for GameStop (GME) January 2021

		Amount Executed		Net Price Improvement	
	Total GME Shares Executed	Inside The Quote	Outside The Quote	Total	Per Share
Citadel Execution Services	248,741,403	$19,218,700.09	$4,706,576.58	$14,512,123.50	$0.06
G1 Execution Service	68,095,050	$5,800,811.29	$1,526,514.42	$4,274,296.86	$0.06
Two Sigma Securities	21,702,917	$1,127,760.70	$571,006.15	$556,754.55	$0.03

I calculated the total dollar amount of orders in GameStop stock executed inside the quote and outside the quote for each venue. For all three venues, the dollar amount of orders executed inside the quote (receiving price improvement) exceeded the dollar amount of orders executed outside the quote (receiving price disimprovement), resulting in net price improvement, in aggregate, for GameStop stock orders routed to them in January 2021. The average price improvement ranged from $0.03 to $0.06 per share.

Recommendations for Payment for Order Flow

The SEC Division of Examinations should expand its ongoing initiative in the area of payment for order flow.[31] The Division should focus its efforts on order routing and best execution obligations in a zero-commission environment.

The Commission should hold a roundtable to discuss payment for order flow. The event would provide a public forum for in-depth discussions of how payment for order flow is working in a zero-commission environment.

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[29] Securities Exchange Act Release No. 51808 (June 9, 2005), 70 FR 37496 (June 29, 2005).
[30] Id.
[31] U.S. Securities and Exchange Commission 2021 National Examination Priorities, Division of Examinations, available at *https://www.sec.gov/files/2021-exam-priorities.pdf.*

The Commission should consider amending Rule 605 and Rule 606 of Regulation NMS to provide better public transparency of execution quality measures. For example, the Commission should consider requiring each broker to report execution quality measures for every stock they route to every market center quarterly (or monthly).

Short-Selling and Securities Lending

Some have attributed at least part of the large influx of buy orders that pushed up the stock price to a short squeeze, causing short-sellers to buy additional shares to cover their short positions. The episode has created a lot of interest in the effects that short-sellers have on the market.

It is important to remember that abusive short-selling—sales to manipulate a stock price—is already illegal. The SEC has promulgated rules to prohibit abusive short-selling practices and regularly enforces those rules.[32] As a result, the vast majority of short sales that occur in the United States are legal.[33]

Academic research shows that short-selling generally has a positive effect on market quality. According to a recent study, "most empirical papers report that during periods of regular trading activity, short-selling has a positive influence on liquidity, price discovery and price efficiency, thus supporting the idea that short-selling is crucial to maintain the orderly functioning of markets."[34] [35] Also, "the existing evidence short-selling cannot be blamed for having triggered downward price reversal during the 2008 financial crisis."[36] Short-sellers also protect other investors by detecting and publicizing fraud.[37]

Regulation SHO requires a broker-dealer to have reasonable grounds to believe that the security can be borrowed so that it can be delivered on the date delivery is due before effecting a short sale order in any equity security.[38] However, it has been widely reported that approximately 140 percent of GameStop's stock had been sold short. At least part of this disparity can be attributed to a lack of transparency in securities lending.

Recall the massive U.S. Government bailout of the creditors of the insurance giant American International Group, Inc. (AIG). AIG's failure was mainly due to its credit default swaps portfolio and its securities lending program, not its insurance business. AIG's credit default swap and securities lending counterparties received much of the Government bailout.[39] Title VII of the Dodd–Frank Act[40] established a regulatory framework for swaps (and securities-based swaps), and the SEC and CFTC have promulgated regulations under the statute. Section 984 of Dodd–Frank required the SEC to "promulgate rules that are designed to increase the transparency of information available to brokers, dealers, and investors, with respect to the loan or borrowing of securities."[41]

To date, the SEC has finalized only one rule that could be characterized as being responsive to Dodd-Frank Section 984. To increase the comparability of securities lending fees between open-end funds, the Commission adopted amendments to fund registration statements. The amendments required disclosures relating to fund secu-

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[32] See "Short Sales (Regulation SHO)", Final Rule, SEC Release No. 34-50103 (Jul 28, 2004), 69 FR 48008 (Aug. 6, 2004), available at *https://www.sec.gov/rules/final/34-50103.htm*.

[33] See, e.g., "Key Points About Regulation SHO", SEC Office of Investor Education and Advocacy publication (Apr. 8, 2015), available at *https://www.sec.gov/investor/pubs/regsho.htm.*

[34] Stefano Alderighi and Pedro Gurrola Perez, "What Does Academic Research Say about Short-Selling Bans?" WFE Research Working Paper (Apr. 29, 2020), available at *https://ssrn.com/abstract=3775704*.

[35] The same study shows that academic research finds that short-selling bans disrupt the orderly functioning of markets. Their negative effects include reducing liquidity, increasing price inefficiency, and hampering price discovery.

[36] Id.

[37] See, e.g., Testimony of Owen A. Lamont, "Hedge Funds and Independent Analysts: How Independent Are Their Relationships?" Hearing before the U.S. Senate Committee on the Judiciary (Jun. 28, 2006), available at *https://www.govinfo.gov/content/pkg/CHRG-109shrg31059/html/CHRG-109shrg31059.htm*. Regulation SHO provides limited exceptions for market makers when fulfilling their market maker obligations.

[38] See, e.g., "Key Points About Regulation SHO", SEC Office of Investor Education and Advocacy publication (Apr. 8, 2015), available at *https://www.sec.gov/investor/pubs/regsho.htm.*

[39] See, e.g., Congressional Oversight Panel, June Oversight Report, "The AIG Rescue and Its Impact on Markets, and the Government Exit Strategy" (June 10, 2010); Louise Story and Gretchen Morgenson, In "U.S. Bailout of AIG, Forgiveness for Big Banks", *New York Times* (June 29, 2010); William Greider, "The AIG Bailout Scandal", *The Nation* (Aug. 6, 2010); Scott E. Harrington, "The Financial Crisis, Systemic Risk, and the Future of Insurance Regulation" (Sept. 2009).

[40] Dodd–Frank Wall Street Reform and Consumer Protection Act, Pub. L. No. 111-203 (2010).

[41] Dodd–Frank Wall Street Reform and Consumer Protection Act, §984(b), Pub. L. No. 111-203 (2010).

rities lending activities, including income and fees from securities lending and the fees paid to securities lending agents in the prior fiscal year.[42] These amendments were a good start, but the SEC should further improve the transparency of securities lending.

Recommendations for Short-Selling and Securities Lending

The SEC should hold a public forum and open a request for comment on the transparency of securities lending. In evaluating various transparency alternatives, the SEC should distinguish between "regulatory reporting" and "public transparency." Regulatory reporting refers to the information available to the SEC to perform its regulatory functions. Public transparency refers to the information that the SEC makes available to market participants, investors, and academic researchers.

Then, the SEC should use economic analysis to determine whether and, if so, how to increase regulatory reporting in securities lending. The SEC should conduct a separate economic analysis to determine how much, if any, new information should be provided to the public.

Accredited Investor Definition

As mentioned above, low-income households have lower rates of ownership of public companies than high-income households. In 2019, 15 percent of households in the lowest income quintile held stocks in public companies—directly or indirectly through funds and retirement savings accounts—compared to 88 percent of households in the highest income quintile.[43] While I am not aware of any statistics on ownership rates by household income level for private companies, the gap is undoubtedly worse. SEC rules effectively prohibit low-income investors from investing in this high-growth sector of the economy.

The SEC's accredited investor definition essentially divides the world of private company investors into two arbitrary categories of individuals—those persons who are accorded the privileged status of being an accredited investor and those who are not.[44] In short, if you make $200,000 or more in annual income or have $1 million or more in net worth, then you are in the privileged class and could choose to invest in the full panoply of investments, whether public or private.[45] If not, the SEC has decided that, for your protection, you are restricted access to invest in private companies.

As an SEC commissioner, I took my investor protection mandate extremely seriously. However, I challenge the SEC's investor protection rationale for prohibiting nonaccredited investors from investing in high-risk companies. Here, I appeal to two well-known concepts from the field of financial economics. The first is the risk-return tradeoff. Because most investors are risk averse, riskier securities must offer investors higher expected returns. As a result, prohibiting non-accredited investors from investing in high-risk securities is the same thing as prohibiting them from investing in high-expected-return securities.

The second economic concept is modern portfolio theory. By holding a diversified portfolio of securities, investors reap the benefits of diversification; that is, the risk of the portfolio as a whole is lower than the risk of any individual securities. The statistical correlation of returns is key. When adding higher-risk, higher-return securities to an existing portfolio, as long as the new securities' returns are not perfectly positively correlated with (move in exactly the same direction as) the existing portfolio, investors can reap higher portfolio returns with little or no change in over-

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[42] See, "SEC Adopts Rules To Modernize Information Reported by Funds, Require Liquidity Risk Management Programs, and Permit Swing Pricing", Press Release (Oct. 13, 2016), available at *https://www.sec.gov/news/pressrelease/2016-215.html*.

[43] See "Main Street Owns Wall Street", ICI Viewpoints, Sarah Holden and Michael Bogdan (Feb. 10, 2021), available at *https://www.ici.org/viewpoints/21-view-equityownership*.

[44] See, e.g., Remarks at the Meeting of the SEC Advisory Committee on Small and Emerging Companies, Public Statement by Commissioner Michael S. Piwowar (May 18, 2016), available at *https://www.sec.gov/news/statement/piwowar-opening-remarks-acsec-051816html.html*; Remarks at the "SEC Speaks" Conference 2017: "Remembering the Forgotten Investor", Speech by Acting Chairman Michael S. Piwowar (Feb. 24, 2017), available at *https://www.sec.gov/news/speech/piwowar-remembering-the-forgotten-investor.html*.

[45] The SEC recently expanded the definition of accredited investor to include, among other things, individuals "holding in good standing one or more professional certifications or designations or other credentials from an accredited educational institution that the Commission has designated as qualifying an individual for accredited investor status[.]" See "Accredited Investor Definition", Final Rule, SEC Release Nos. 33-10824; 34-89669 (Aug. 26, 2021), 85 FR 64234 (Oct. 9, 2020), available at *https://www.sec.gov/rules/final/2020/33-10824.pdf*. However, the expanded definition is not likely to substantially increase the number of low-income individuals who qualify under the new definition.

all portfolio risk. In fact, if the correlations are low enough, the overall portfolio risk could actually decrease.

These two concepts show how even a well-intentioned investor protection policy can ultimately harm the very investors the policy is intended to protect. Moreover, restricting the number of accredited investors in the privileged class can have additional adverse impacts. The accredited investors may enjoy even higher returns because the nonaccredited investors are prohibited from buying and bidding up the price of high-risk, high-expected-return securities. Remarkably, by allowing only high-income and high-net-worth individuals to reap the risk and return benefits from investing in certain securities, the SEC is actually exacerbating wealth inequality.[46] [47]

Recommendation for the Accredited Investor Definition

The SEC should revisit the accredited investor definition and solicit public feedback on achieving more equitable access to investing in private companies across all income levels. Based on that feedback, the SEC should engage in rulemaking to open up these investment opportunities to all Americans.

The Role of the Senate Banking Committee

Throughout my testimony, I have made several recommendations for the SEC. This Committee, through its oversight role, has the opportunity to influence the SEC's agenda toward improving the current state of retail investing. If this Committee believes that the SEC's market structure and market infrastructure rules should keep pace with changes in markets and technologies, "deep-dive" hearings on specific issues—both SEC oversight hearings and hearings with subject matter expertise—would be helpful.

If this Committee believes legislation would be necessary to improve a particular market structure or market infrastructure policy, I urge caution in legislating prescriptive standards. For the reasons stated above, the SEC is in the best position to promulgate rules based on the current environment and update those rules as needed in response to changes in the markets and technologies.

Thank you for bringing attention to these critical issues and for the opportunity to testify here today. I am happy to answer any questions you may have.

PREPARED STATEMENT OF ANDREW N. VOLLMER

SENIOR AFFILIATED SCHOLAR, MERCATUS CENTER AT GEORGE MASON UNIVERSITY

MARCH 9, 2021

Chairman Brown, Ranking Member Toomey, and Members of the Committee: I am pleased to have an opportunity to comment on several timely and important issues related to the Federal securities laws. I have extensive experience with those laws. I was Deputy General Counsel of the Securities and Exchange Commission from mid-2006 to March 2009 and taught courses on securities regulation at the University of Virginia School of Law from 2014 to 2019. For many years, I was a partner in the securities enforcement practice of Wilmer Cutler Pickering Hale and Dorr LLP and am currently a senior affiliated scholar with the Mercatus Center at George Mason University.

My testimony will address (1) the recent trading activity in the common stock of GameStop Corp. and a few other companies, (2) securities trading platforms such as Robinhood Financial, and (3) considerations for further action. My conclusion is that the information currently available has not revealed a problem of sufficient severity to justify Congress imposing new regulations in these areas.

New information could change that, but, in any deliberations about possible additional legal restrictions, Congress should give weight to and respect the personal liberty interests involved.

Gamestop

The rapid increase and decrease in the price of the common stock of GameStop and a few other companies has received a great deal of attention. My information about the events during the past several weeks is from publicly available sources, and my understanding is that various investigations into the details are being conducted. My views are based on the public information, but new information and de-

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[46] See Thomas Piketty, "Capital in the Twenty-First Century", translated by Arthur Goldhammer (Cambridge MA: The Belknap Press of Harvard University Press, 2014).

[47] Another unfortunate consequence of the accredited investor definition is that small businesses face higher costs of capital.

tails from the investigations could affect my opinions. I am open to persuasion from new facts.

Based on the information I have seen, misconduct probably did not occur in the recent trading of GameStop. Some concerns about a pump-and-dump scheme or a manipulation have been raised, but the public information does not bear those fears out. In the standard type of pump-and-dump scheme, one or more persons make material false or misleading statements to the market to drive a stock price up or down. The SEC is investigating, but my understanding is that the main group of individuals trading GameStop, those using the Reddit WallStreetBets social media forum, did not make material false or misleading statements and were not deceived by others.

For securities manipulation, a person needs to create a false impression of buying or selling activity. The Supreme Court has said that manipulation is "virtually a term of art when used in connection with the securities markets."[1] Manipulation "refers generally to practices, such as wash sales, matched orders, or rigged prices, that are intended to mislead investors by artificially affecting market activity."[2] Some important legal authorities have taken broader approaches,[3] but the essence of a manipulation is buying or selling activity that is not legitimate or genuine.

The traders using the WallStreetBets site actually bought GameStop and the other stocks. If a person bears market risk, that is, a non-trivial risk that the buyer or seller will make or lose money on the transaction, then the person did not engage in artificial trading even if he or she had evil intent. In addition, when a person actually buys stock, it is very hard to tell the difference between evil intent to manipulate the stock price up and a person's desire for the stock price to go up naturally.

The effects of the GameStop trading on the larger secondary market for securities do not, at the moment, appear to be widespread or severe. The trading activity in GameStop, AMC, and Blackberry was limited to a few companies and was short term. Some investors made money in GameStop and some lost money. Short sellers of GameStop might have a legitimate complaint about the WallStreetBets buyers, and the short sale rules in the securities laws could be reviewed, but those rules were not the major cause of the price increases. The sharp rise and fall in the price of GameStop did not have apparent effects on broader market gauges.[4] Even if an index fund or an exchange traded fund owned GameStop, that holding was only one name in a diversified portfolio, and the price of GameStop stock began to correct itself within a short time with no significant damage to the pricing or liquidity in the more general market for listed equities.

I do not want to sound like I encourage the behavior of the WallStreetBets traders. I do not. The actions of the GameStop buyers were not consistent with the purpose of the Federal securities markets. The purpose of the securities markets is to allow companies with good ideas to raise capital and to let millions of investors buy and sell existing shares based on their assessment whether companies have good commercial ideas or not.

My understanding is that the WallStreetBets crowd was engaged in group behavior that was in part to stymie some short sellers, in part to identify with the other members of the group, and in part to have some entertainment. Most were not buying and selling GameStop based on an assessment of the likelihood of profit at the company (although some were), but those buying without analysis of the fundamental value of the retailer knew what they were doing, were not misled, and knew they could lose money. As discussed below, the events surrounding GameStop do not appear to require new securities restrictions or regulation.

Robinhood

The broker-dealer Robinhood has come under scrutiny because many of the WallStreetBets traders use it and because it has certain features that encourage buying and selling securities. Those features include commission free trades, accounts with no minimum dollar amounts, the availability of option trading and frac-

[1] Ernst & Ernst v. Hochfelder, 425 U.S. 185, 199 (1976).

[2] Sante Fe Indus., Inc. v. Green, 430 U.S. 462, 476-77 (1977); see also Schreiber v. Burlington Northern, Inc., 472 U.S. 1, 6 (1985).

[3] See, e.g., Markowski v. SEC, 274 F.3d 525 (D.C. Cir. 2001).

[4] Anneken Tappe, U.S. stocks post their worst month since October as the GameStop frenzy rages, CNN Business (Jan. 29, 2021) (reporting that, in January 2021, the month of the GameStop increase, the Dow and the broader S&P 500 had their worst month since October), *https://www.cnn.com/2021/01/29/investing/dow-gamestop-stock-market-today/index.html.* Data from Google Finance show that GameStop went up 1784 percent in January 2021 while the S&P 500 index went up 0.4 percent and the Russell 2000 index, which included GameStop at the time, went up 6.6 percent.

tional shares of stock, and an ability to buy and sell securities on an attractive, easy-touse internet site. Some have called the Robinhood mobile app the "gamification" of securities trading.

The criticisms of Robinhood fail to give appropriate weight to the benefits of its business model. The Robinhood brokerage service is innovative and makes significant positive contributions to society and the economy. It reduces costs for consumers, makes securities trading simpler and easier, increases consumer choice, and lowers barriers to participation in the market for the common stock of companies listed on stock exchanges. It therefore opens the securities markets and equity securities ownership to a much larger part of the population and to people with less income and wealth than those who are typically associated with participation in the equity markets.

Expanding access to the equity securities markets for many new retail investors is especially notable. It is directly responsive to the concern that direct ownership of corporate stocks by individuals has declined since World War II.[5] It is also directly responsive to the desire to make exchange-listed securities more accessible to lower income people and to give them more opportunities to increase wealth.[6]

Robinhood therefore increases consumer welfare and achieves important objectives of the U.S. economic and financial system. All of this is commendable and should not be faulted.

Another question about Robinhood was the decision to restrict the ability of its customers to buy GameStop and other securities for a short period of time. In his testimony before the House Financial Services Committee on February 18, 2021, the head of Robinhood explained the circumstances leading to the restrictions. Robinhood received an unexpected call for a large amount of collateral from a financial institution that is the clearinghouse for the trades of Robinhood customers. The restriction on the purchases of GameStop was part of the response because Robinhood was not able immediately to provide the requested collateral. Robinhood explained that it did not restrict customers because of a desire to help short sellers or its main wholesale broker.

Considerations for Further Action

The events surrounding the changes in prices for GameStop and the questions about the Robinhood trading platform have so far not revealed the kind of problem that would justify new legal restrictions or regulations. New regulation would be appropriate if data and evidence emerge to show a severe, sustained, recurring harm to investors that a law could prevent or reduce. We have not seen such a harm yet, but the more detailed investigations being undertaken could produce evidence of misconduct or reasons to reconsider the need for new regulation.

Congress and the SEC should not impose new regulations lightly. An important consideration should be that government rules typically restrict personal freedom. The GameStop traders might not have been analyzing the fundamental financial position of GameStop within the traditions of the capital markets, but they were exercising their individual civil liberty. A founding principle and continuing aspiration of the country has been to preserve personal freedom, extend it when it has been denied, and use government regulation only when a serious and widespread harm is recurring. If regulation is justified, it should be narrow and go no further than necessary to correct the harm.

[5] Kristian Rydqvist et al., Government policy and ownership of equity securities, 111 *J. Fin. Eco.* 70, 71 (2014) ("Since World War II, household direct equity ownership has declined precipitously. In the United States, just after the war, households directly own 90 percent of the stock market; by 2010, this figure has come down to below 30 percent.").

[6] The United States has made progress increasing household ownership of securities when both direct ownership and indirect ownership are considered. Indirect ownership means ownership of corporate equities through mutual funds or retirement plans. The percent of U.S. households owning stock directly and indirectly grew from approximately 32 percent in 1989 to 53 percent in 2019. When indirect ownership is taken into account, all income groups from the lowest to the highest quintile of family income increased stock ownership. This information is from a report of the Investment Company Institute that summarized the Federal Reserve Board's 2019 Survey of Consumer Finances. See Sarah Holden & Michael Bogdan, "Main Street Owns Wall Street, ICI Viewpoints" (Feb. 10, 2021), *https://www.ici.org/pdf/21-view-equityownership-print.pdf.*

RESPONSES TO WRITTEN QUESTIONS OF SENATOR SINEMA FROM MICHAEL S. PIWOWAR

Q.1. Federal regulations tend to privilege institutional investors because of the presumption that they are more sophisticated. Given recent events, does it still make sense to treat institutional investors and retail investors differently when it comes to accessing certain types of offerings?

Should we be assuming that institutional investors always make better investments than retail investors?

A.1. As I mentioned in my written testimony, U.S. Securities and Exchange Commission (SEC) rules effectively prohibit low-income, low-net-worth investors from investing in high-growth companies.

The SEC's accredited investor definition essentially divides the world of private company investors into two arbitrary categories of individuals—those persons who are accorded the privileged status of being an accredited investor and those who are not. In short, if you make $200,000 or more in annual income or have $1 million or more in net worth, then you are in the privileged class and could choose to invest in the full panoply of investments, whether public or private. If not, the SEC has decided that, for your protection, you are restricted access to invest in private companies.

As an SEC commissioner, I took my investor protection mandate extremely seriously. However, I challenge the SEC's investor protection rationale for prohibiting nonaccredited investors from investing in high-risk companies. Here, I appeal to two well-known concepts from the field of financial economics. The first is the risk-return tradeoff. Because most investors are risk averse, riskier securities must offer investors higher expected returns. As a result, prohibiting non-accredited investors from investing in high-risk securities is the same thing as prohibiting them from investing in high-expected-return securities.

The second economic concept is modern portfolio theory. By holding a diversified portfolio of securities, investors reap the benefits of diversification; that is, the risk of the portfolio as a whole is lower than the risk of any individual securities. The statistical correlation of returns is key. When adding higher-risk, higher-return securities to an existing portfolio, as long as the new securities' returns are not perfectly positively correlated with (move in exactly the same direction as) the existing portfolio, investors can reap higher portfolio returns with little or no change in overall portfolio risk. In fact, if the correlations are low enough, the overall portfolio risk could actually decrease.

These two concepts show how even a well-intentioned investor protection policy can ultimately harm the very investors the policy is intended to protect. Moreover, restricting the number of accredited investors in the privileged class can have additional adverse impacts. The accredited investors may enjoy even higher returns because the non-accredited investors are prohibited from buying and bidding up the price of high-risk, high-expected-return securities. Remarkably, by allowing only high-income and high-net-worth individuals to reap the risk and return benefits from investing in certain securities, the SEC is actually exacerbating wealth inequality.

The SEC should revisit the accredited investor definition and solicit public feedback on achieving more equitable access to investing in private companies across all income levels. Based on that feedback, the SEC should engage in rulemaking to open up these investment opportunities to all Americans.

RESPONSES TO WRITTEN QUESTIONS OF SENATOR CRAPO FROM MICHAEL S. PIWOWAR

Q.1. A Financial Transaction Tax (FIT) would impact all Americans regardless of income through their retirement funds, 529 college savings plans and ABLE plans for disabled dependents. With the investments of such a large portion of Americans across the income spectrum impacted, the effect of an FTT would ultimately make markets less efficient by reducing market volumes and decreasing the level of liquidity in the system. What kinds of regulatory measures and systemic safeguards must be in place to counteract the negative impacts of an FTT?

A.1. Imposing a financial transaction tax (FTT) in the United Sates would result in many negative effects, including unnecessarily hurting the global competitiveness of U.S. capital markets.

In 2009, when I was a senior economist at the President's Council of Economic Advisers, I was asked to conduct research and prepare a memo for President Obama's top economic policy advisors on the potential effects of a financial transaction tax. My research showed that, without exception, every time an FTT was introduced in another jurisdiction, it resulted in disastrous consequences. My research yielded three key points:

1. FTTs hurt market quality. Several empirical studies showed that the imposition of FTTs results in higher volatility, lower liquidity, and lower trading volume. [1] As a result, FTTs have negative effects on price discovery and lead to a reduction in the information efficiency of markets. [2]

2. Jurisdictions that do not impose an FTT win at the expense of jurisdictions that do. For example, when the Sweden imposed an FTT in the 1980s, a significant amount of trading volume simply move to the London stock market. [3] Keep in mind that this occurred 40 years ago when it was much more difficult and costly to divert trading activity across borders. A similar tax today would result in immediate and devastating results.

3. FTTs never raise the expected revenue. Because trading volume declines (and moves to other jurisdictions) when FTTs are imposed, actual FTT revenues never come close to the projections made by proponents. As a result, the main "benefit" of an FTT is never worth the costs.

I was gratified to receive very positive feedback on my research and memo. More importantly—and quite correctly—the Obama administration never pursued a policy of trying to impose an FTT in the United States.

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[1] See, e.g., "Securities Transaction Taxes and Financial Markets", Karl Habermeier and Andrei Kirilenko, IMF Working Paper 01-51 (2001) available at *http://www.imf.org/external/pubs/ft/wp/2001/wp0151.pdf*; and "Transaction Taxes and the Behavior of the Swedish Stock Market', Steven R. Umlauf, *Journal of Financial Economics*, Vol 33, No. 2 (1993).

[2] Id.

[3] See, e.g., Umlauf (1993).

More recently, I have become aware of additional research that shows FTTs have harmful effects beyond direct capital markets effects. An FTT imposed in the United States would harm everyday Americans in a number of ways:

1. An FTT would harm everyday Americans saving and investing for retirement. Main Street investors would pay the tax directly when they trade, and pay it again as financial intermediaries pass on the taxes they face as a cost of doing business.[4] According to one study, under the version of the tax proposed by Senator Bernie Sanders (D-VT), a typical retirement investor will end up with 8.5 percent less in his or her 401(k) or IRA after a lifetime of savings.[5] In dollar terms, the average IRA investor would have $20,000 less at retirement as a result of this tax.[6] FTTs paid by pension funds would reduce their returns and worsen existing problems with underfunded pensions.[7]

2. An FTT would harm the owners, workers, and customers of businesses. FTTs increase the cost of capital for any company whose securities are subject to the FTT. As a result, owners of those companies—including Main Street investors who hold those securities directly or indirectly in mutual funds and exchange-traded funds (ETFs)—would be harmed through lower returns to capital.[8] Workers would be harmed through lower returns to labor.[9] Customers would be harmed through an increase in the cost of consumer goods.[10]

3. An FTT would harm all American taxpayers. In addition to the increased costs of consumer goods, everyday Americans would be harmed by other indirect effects of FTTs. The level and growth of GDP would be reduced under an FTT, resulting in a lower standard of living.[11] Moreover, indirect tax effects would pernicious and counterproductive. Lower income and payroll taxes would result from the increased cost of capital to businesses, and the incentive to hold off on the sale of financial assets to avoid capital gains taxation would exacerbate the lock-in effect of these taxes.[12]

RESPONSES TO WRITTEN QUESTIONS OF SENATOR HAGERTY FROM MICHAEL S. PIWOWAR

Q.1. The recent volatility in certain stocks has increased talk about imposing a financial transaction tax as a downpayment on the Democrats' pmtisan $1.9 trillion dollar, decade-long spending spree.

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[4] See, e.g., "Financial Transaction Taxes: A Tax on Investors, Taxpayers, and Consumers", James J. Angel, Center for Capital Markets Competitiveness (2019), available at *https://www.centerforcapitalmarkets.com/resource/financial-transaction-taxes-a-tax-on-investors-taxpayers-and-consumers/*.

[5] Id.

[6] Id.

[7] See, e.g., Angel (2019); and "The Hidden Costs of a Financial Transaction Tax: Estimated Impact on Pension Funds", Kirsten Wegner, Modern Markets Initiative (2018), available at *https://www.modernmarketsinitiative.org/ftt*.

[8] See, e.g., "The Impact of a Financial Transactions Tax", Colin Miller and Anna Tyger, Tax Foundation Fiscal Fact No. 690 (2020), available at *https://files.taxfoundation.org/20200122152248/The-Impact-of-a-Financial-Transactions-Tax.pdf*; and Angel (2019).

[9] Id.

[10] Id.

[11] Id.

[12] Id.

This would likely raise trading costs, weaken market liquidity, harm pensions, and limit everyday Americans' access to investing.

What are some of the adverse effects of imposing a financial transaction tax, including on the global competitiveness of U.S. capital markets?

A.1. Imposing a financial transaction tax (FTT) in the United Sates would result in many negative effects, including unnecessarily hurting the global competitiveness of U.S. capital markets.

In 2009, when I was a senior economist at the President's Council of Economic Advisers, I was asked to conduct research and prepare a memo for President Obama's top economic policy advisors on the potential effects of a financial transaction tax. My research showed that, without exception, every time an FTT was introduced in another jurisdiction, it resulted in disastrous consequences. My research yielded three key points:

1. FTTs hurt market quality. Several empirical studies showed that the imposition of FTTs results in higher volatility, lower liquidity, and lower trading volume.[1] As a result, FTTs have negative effects on price discovery and lead to a reduction in the information efficiency of markets.[2]

2. Jurisdictions that do not impose an FTT win at the expense of jurisdictions that do. For example, when the Sweden imposed an FTT in the 1980s, a significant amount of trading volume simply move to the London stock market.[3] Keep in mind that this occurred 40 years ago when it was much more difficult and costly to divert trading activity across borders. A similar tax today would result in immediate and devastating results.

3. FTTs never raise the expected revenue. Because trading volume declines (and moves to other jurisdictions) when FTTs are imposed, actual FTT revenues never come close to the projections made by proponents. As a result, the main "benefit" of an FTT is never worth the costs.

I was gratified to receive very positive feedback on my research and memo. More importantly—and quite correctly—the Obama administration never pursued a policy of trying to impose an FTT in the United States.

More recently, I have become aware of additional research that shows FTTs have harmful effects beyond direct capital markets effects. An FTT imposed in the United States would harm everyday Americans in a number of ways:

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[1] See, e.g., "Securities Transaction Taxes and Financial Markets", Karl Habermeier and Andrei Kirilenko, IMF Working Paper 01-51 (2001) available at *http://www.imf.org/external/pubs/ft/wp/2001/wp0151.pdf*; and "Transaction Taxes and the Behavior of the Swedish Stock Market", Steven R. Umlauf, *Journal of Financial Economics*, Vol 33, No. 2 (1993).

[2] Id.

[3] See, e.g., Umlauf (1993).

[4] See, e.g., "Financial Transaction Taxes: A Tax on Investors, Taxpayers, and Consumers", James J. Angel, Center for Capital Markets Competitiveness (2019), available at *https://www.centerforcapitalmarkets.com/resource/financial-transaction-taxes-a-tax-on-investors-taxpayers-and-consumers/*.